THE CHEMIST AND DRUGGIST

ESTAB. 1859

REGISTERED AS A NEWSPAPER

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TELEGRAMS: "CHEMICUS, CANNON, LONDON" (2 Words)

PUBLISHED WEEKLY AT 42 CANNON STREET, LONDON, E.C.4.

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No. 2578. JULY 6, 1929. Vol. CXI.

Index to Advertisers, pp. 5 & 6.


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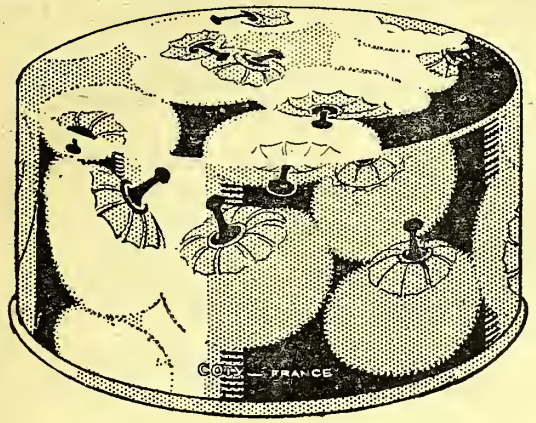

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THIS Summer the sunburned "Tan" complexion will be the vogue! The new Coty "Ocre d'Orient" obviates the necessity of undergoing the usual "tanning torture" or sunburn, which this popular complexion shade has hitherto entailed. Tell your customers about the

New
COTY
OCRE D'ORIENT

It eliminates the suffering of acquiring the genuine sun-tan and its effect cannot be distinguished from *real* sunburn. There will be an enormous demand for this fascinating powder once your customers know its unique qualities!

For the very blonde type you can safely recommend COTY OCRE ROSEE

It is a lighter tone than Ocre d'Orient but gives the same delightful tanned open-air shade.

La Crème Coty

is the finest protection against sunburn—it preserves and protects the skin from the sun's rays. Applied under Coty Face Powder, it keeps the complexion smooth and soft.

Show these Coty lines—they sell themselves

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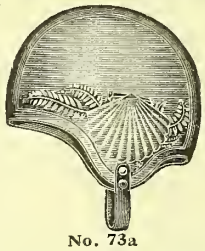

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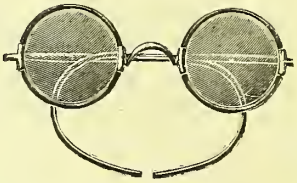

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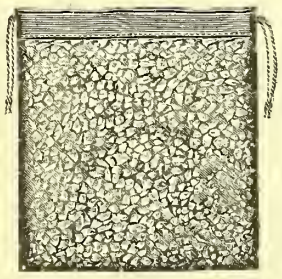

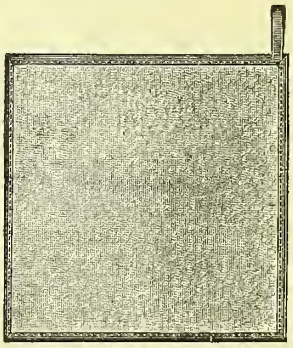

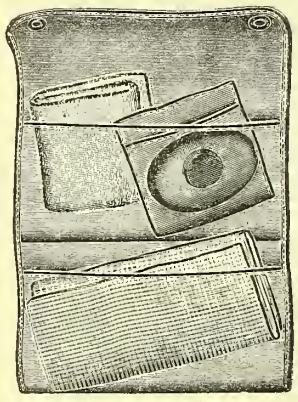

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No. 105

BATHING CAPS

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Coloured Helmet, various decorations	228	7/6
Diving Helmet, with Chin Strap, Assorted colours	474	17/6
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Full range of other models from **2/9** *to* **51/–** *per doz.*

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Large, Fancy Floral Georgette—

Lambswool	White Down	Tinted Down
Per doz. **12/6**	**14/6**	**16/6**

Special List of Powder Puffs on application.

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Fancy Sateen ,,	7/–	8/6	10/–	13/6
Art Silk ,,	12/–	14/6	18/6	21/–

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	Per doz.
Glarex, with Crookes' lenses, each in case	15/–
Windsor, Rolled Gold Bridge and Curl Sides, Shell Rims, each in case. Fig. 476c	22/6

Cheaper qualities at **3/9** *and* **7/6** *per doz.*

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	Per doz.
Shot Silk, Assorted Colours, containing Towel, Washing Square and Soap No. 27	32/–

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Mermaid, each in transparent envelope 3 doz. at 9/–	9/9

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	Per doz.
White Turco, Whipped Borders, 12″×11″	2/9
White Turco, Fringed, 12″×13″	3/6
Assorted Coloured Borders, Fringed, 12″×12″	3/6
Double Faced, Coloured Stitched Binding 12″×12″	5/3

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English and Foreign Proprietary Medicines, Perfumery, Toilet Goods, Druggists' Sundries

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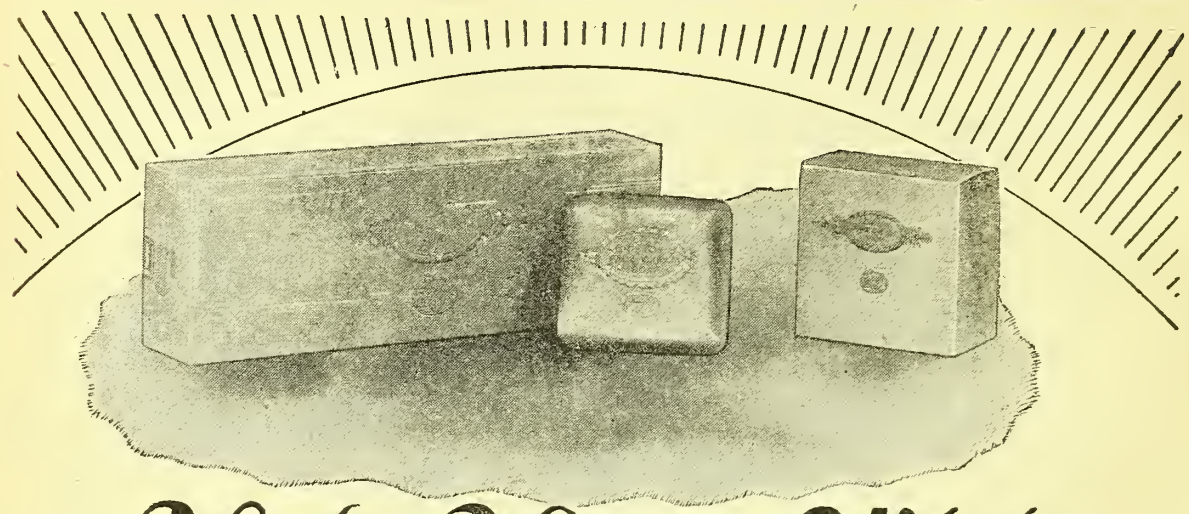
Cables and Marconigrams: "ALLUWANT, LONDON." Telephone: CLERKENWELL 5906 (Private Branch Exchange). Telegraphic Address: "POMADE, SMITH, LONDON."

INDEX TO ADVERTISERS

[*Continued overleaf.*

INDEX—cont.



Make Money While the Sun Shines!

What it is

Bristow's Face Cream Soap is a skilful combination of finest grade Toilet Soap with highly concentrated milk and olive oil of the finest quality and purity.

Cleansing, emollient, soothing and nourishing, it forms the perfect substitute for night cream. Perfumed with Eau de Cologne, it is wonderfully refreshing. It retails at **9d.** *per tablet (cartons of three* **2/-**) *and carries profitable discounts and extra liberal introductory bonus terms.*

Now, when countless complexions are suffering from the effects of summer sunshine, you can attract fresh business and win the thanks of your customers by prominently displaying and recommending this new Toilet Soap, which is as soothing as Cold Cream.

Pharmacists all over the country, realising the exceptional possibilities of this unique preparation, are laying in stocks and booking Window Displays.

Be one of the first in the field. Write NOW for free samples and particulars of the specially profitable bonus terms which are available.

BRISTOW'S
FACE CREAM SOAP

T. F. BRISTOW & CO., LTD., COLINDALE, HENDON, N.W.9

Phone : Colindale 6474

A Good Product—A Good Display

A Pharmaceutical Sales Policy

"MINERAL SPRING" is one of the very few nationally known salines with a definitely pharmaceutical selling policy. Its quality ensures "repeats." Its sales policy ensures that the chemist reaps the benefit. Specialise in "Mineral Spring" because, by doing so, you build up your own good-will. Keep this window show prominently before your customers—it tells the story naturally but effectively and will pay for the space you give it many times over. It is available with orders of 4 dozen and upwards.

To EXPORT BUYERS—All orders and enquiries should be addressed to our Sole Export Agents Wm. ALFRED JONES Ltd., West India House, Liverpool

THOMAS KERFOOT & Co LTD
BARDSLEY VALE, LANCASHIRE,
& Bardsley House, London, N.1
ESTABLISHED 1797.

D/194

The door through which your Profits come

HALF-OPENED *by*

our advertising, which will bring you increased printing and developing business and larger sales of Golden Glory.

ONLY YOU CAN OPEN

the other half by giving a free entry form for the competition to all your customers.

WRITE TO US FOR ENTRY FORMS

and show material and follow the example of Messrs. Kodak, Agfa and Houghton-Butcher by linking up your photographic business with this competition.

A. & F. PEARS LTD.
The Soap Works
ISLEWORTH, Near LONDON

Vinolia

The Original BORACIC & COLD CREAM SOAP

BY APPOINTMENT TO H.M. THE KING

DUST-LESS DISPLAY — and a PROFITABLE OFFER

The new cellophane wrapper, with attractive band, makes Vinolia Boracic & Cold Cream Soap entirely dust-proof. It preserves the perfume and delicate colour. You can arrange your bold displays without risk of damage by dust.

OUR SPECIAL DISPLAY OFFER

One 2/6 box of bath tablets free with every 6 doz. toilet size ordered. Profit on outlay on best terms 59 %

One dozen toilet size value 6/- free with every 6 dozen bath size. Profit on outlay on best terms 67 %

ORDER NOW

VINOLIA CO., LTD., BEBINGTON, CHESHIRE

VT 65-29-100

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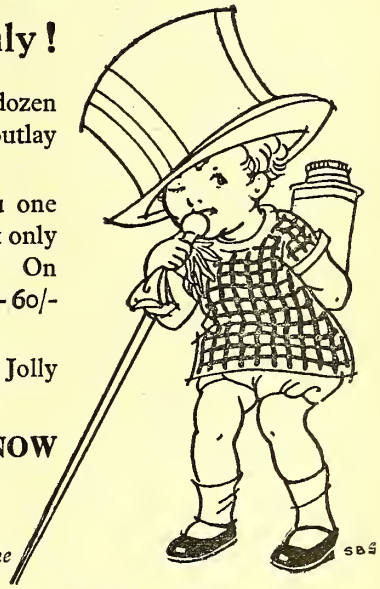
COMPETITION

FREE BONUS OFFER

of Johnson's BABY POWDER during July!



SIX FREE TINS of Johnson's Baby Powder with every six dozen ordered during July! That is the gist of our Bonus Offer. On an outlay of 50/- you make an *extra* 6/- profit!—28/- in all or 56%!

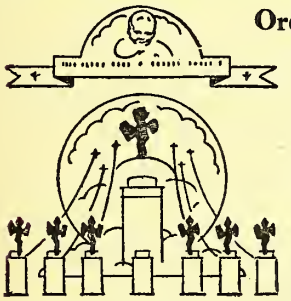
Every additional dozen tins you order at the same time brings you one extra free tin. *And*—if your order is for *one gross* tins or more you not only get one dozen free tins but you also get a discount of 4d. per dozen. On an outlay of 96/-—(instead of 100/-) you make an *extra* profit of 16/- — 60/- in all or 62.7%.

The only condition is that you undertake to show the Johnson's Jolly Baby Competition window display for a week before September 7th.

Order your Johnson's Baby Powder—NOW

BONUS OFFER DEFINITELY CLOSES JULY 31

After that date all orders will be subject to the usual terms.



THE WINDOW DISPLAY

Practical, compact, striking. Above, a coloured streamer to stick to the glass. Standing back below, a coloured cut-out 17" high. In front, Baby Powder tins surmounted by Baby Silhouettes.

ORDER FORM

To :—Johnson & Johnson (Gt. Britain) Ltd., Slough, Bucks.

Please send me *

(a).....dozen tins of Johnson's Baby Powder at 8/4 a dozen (8/- a doz. for orders of 1 gross or over).

(b).....free tins (1 for each dozen ordered), in consideration of my exhibiting your competition window display for not less than a week before September 7th.

(c).....competition entry forms.

The Window Display cut-out, Baby Silhouettes, Window Streamer, Window Sticker.

Name.....

Address.....

*Minimum order to qualify for Bonus terms 6 doz. tins.

POTTER & CLARKE Ltd.

Drug Merchants--Manufacturing Chemists

60, 62, 64, ARTILLERY LANE--LONDON, E.1.

'Phone:-Bishopsgate 4761-5 lines. Grams:-Horehound, phone London (2 words).

and 24, LUNA ST. GT. ANCOATS ST. MANCHESTER

'Phone:-Manchester City-6048. Grams:-Horehound, Manchester.

THE BIG 3

These well-known preparations, of guaranteed purity, are the best of their kind. Keep busy during the coming months by having ample stocks ready from your usual Wholesaler or direct from the manufacturers.

PRICES

Potter's Vitalising

1. FRUIT SALINE

8 oz. bottles (retail 1/9) 13/- dozen
4 oz. bottles (retail 1/3) 8/6 dozen
Attractive show matter with all orders.

All the Year Round

2. HEALTH SALT

4 oz. tins ... ... 4/9 dozen
Gross lots ... ... 4/3 dozen
1/- Bottles (4 oz.) ... 7/6 dozen
1/6 Bottles (8 oz.) ... 12/- dozen

Clarke's

3. LIVER SALTS

4 oz. tins ... ... 5/- dozen
3 Dozen lots ... ... 4/9 dozen
1 Gross lots ... ... 4/6 dozen
Handsome Showcard with all orders

Goodwill and photographic business

The chief difficulty of amateur photographers is exposure. Their goodwill is easy to capture and means much future business.

Start them on the high road to success by selling the

'WELLCOME' PHOTOGRAPHIC EXPOSURE CALCULATOR

HANDBOOK AND DIARY

Retail Price

1/6

Its use ensures correct exposure at all times. It also contains a wealth of information on a variety of photographic subjects.

Price to the Trade, 16/4 *per dozen, subject to usual discount*

BURROUGHS WELLCOME & CO., LONDON

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The CHEMIST & DRUGGIST
Conference Number

JULY 6, 1929

Published at Head Office: 42 CANNON STREET, LONDON, E.C.4. *Branch Offices:* MANCHESTER; MELBOURNE AND SYDNEY, AUSTRALIA.

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Contents

No. 1 Series 2578 Vol. 111

Coming Events

This section is reserved for advance notices of meetings or other events. These should be received by Wednesday of the week before the meetings, etc., occur.

Wednesday, July 10

Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, London, W.C.1, at 11 a.m. Council meeting.

Manchester Pharmaceutical Association, annual picnic to Alton Towers, by motor-saloons. Leave Albert Square at 1.30 p.m. Tickets, 12s. 6d. each inclusive, may be obtained from the secretaries or any member of Council. Tickets for members travelling by private car, 5s. 6d. each.

Thursday, July 11

Inter-Association Sports, Maw's Sports Ground, New Barnet, at 2.45 p.m. Annual gathering of Metropolitan associations.

Business Changes

MR. F. J. MARTIN, Ph.C., has acquired the business of Mr. A. R. Garner, chemist and druggist, 384 Handsworth Road, Sheffield.

MR. R. L. PEARCE, chemist and druggist, trading as B. Salter & Son, Shrewsbury, has taken over the business of Mr. W. H. Rees, chemist and druggist, Newtown, Montgomery.

MR. S. MACHIN, chemist and druggist, has acquired the business of B. Salter & Son, Shrewsbury, from the previous proprietor, Mr. R. L. Pearce, chemist and druggist, and will continue it under the same style.

Gazette

Partnership Dissolved

JENSEN, R. P., AND LAWSON, A. F., 17 Monument Street, London, chemical merchants, under the style of Jensen Lawson & Co.

English and Welsh News

The Editor will be obliged if subscribers will send him marked copies of newspapers containing items of interest for insertion in this or other news sections.

Safeguarding of Key Industries

Representations have been made to the Board of Trade under Section 10 (5) of the Finance Act, 1926, regarding the exemption from Key Industry Duty of lanthanum oxide, neodymium oxide, praseodymium oxide, yttrium oxide, cerium oxide, and mercury vapour rectifiers.

Chemical Merchants Meet

The annual meeting of the British Chemical and Dyestuffs Traders' Association, Ltd., was held in London on June 26, when Mr. Victor Blagden was re-elected president, and Mr. A. F. Butler chairman. The latter in his address summarised the work of the Association during the year. In connection with the key industries duties, he said, the danger of an attempt to widen the scope of this legislation to cover a large number of industrial chemicals was carefully watched. They would remember that at about this time last year the applicants succeeded in obtaining from the Board of Trade Tribunal a decision that calcium biphosphate of baking powder quality was a dutiable product. The verdict did not state it was to be dutiable because it was a "fine chemical," in fact, it gave no reason at all. To this day no one knew why this product was made dutiable, and those who are qualified to express an opinion on the matter are unable to suggest why it was ordered to be included in the list of articles chargeable with duty. The Association immediately sought the opinion of the Board of Trade as to whether they proposed to accept the decision in this case as a precedent, and apply it to a number of other heavy chemicals which were the subject of complaint. The answer received was non-committal, but we believe (said Mr. Butler) we may now conclude that the principle aimed at in the calcium phosphate case is not established, and is not likely to be applied generally. The Exemption Orders which were instituted in 1927 to remove duty from those products not made here continue to operate for a number of products. This revision and modification of the Key Industries Act followed three years' representations by the Association. Reference was made to the effective action taken with regard to the famous Form C., 105, issued by the Customs, which required members to divulge to the department the whole of their business connections, and obtain confidential details. The meeting closed with a cordial expression of appreciation of the work of the secretary, Mr. O. F. C. Bromfield.

Inquests

A verdict of "Suicide whilst of unsound mind" was returned at a recent inquest, at Uttoxeter, on the body of Horace J. Wilson, who died as the result of taking Cooper's sheep dip diluted with ginger beer.

At an inquest at Crosby-on-Eden, on June 15, the coroner found that Arthur Graham, gardener, died through drinking weed-killer containing arsenic while of unsound mind. Dr. Hopwood, principal of the School of Chemistry at Carlisle, said that in the stomach there was 1.2 gr. of arsenic. In the intestine there was 2.9 gr.

Liverpool

Baby Week is being celebrated in the city this week, and some chemists are making special displays.

The interesting Lakeland photographic display which has for the past few weeks occupied the shop window of Mr. John H. Robinson, Tithebarn Street (*C. & D.*, June 22, p. 738), is to be transferred to the window of a Manchester chemist. A photograph of the window appeared in "The Westmorland Gazette" of June 29.

Writing to "The Liverpool Post" of June 28, Mr. W. H. Saunders, chairman of Ayrton, Saunders & Co., Ltd., urges that Liverpool is far too modest in making known its claims to notice from overseas merchants.

Sheffield

Mr. A. R. Garner, chemist and druggist, has disposed of his business at 384 Handsworth Road to Mr. F. J. Martin, Ph.C., who will continue it as Garner & Co.

Mr. John Austen, Ph.C., managing director of G. T. W. Newsholme, Ltd., presided at the recent coming of age of Victoria Hall, and gave an account of early Methodist martyrs in Sheffield.

Miscellaneous

POISON-LICENCE APPLICATION.—Mr. Herbert Payze, 857 High Road, Leytonstone, has applied to the Leyton Town Council for a licence under Section 2 of the Poisons and Pharmacy Act, 1908.

DANGEROUS DRUGS ACTS.—At Bow Street Police Court, London, on June 27, Lionel S. Thompson (27), Wiltshire Road, S.W., described as a druggist's assistant, was fined £10 for being in unlawful possession of cocaine.

FATAL MOTORING ACCIDENT.—On June 23 Mr. E. Moult, a director of Moults, Ltd., chemists, Stockport, was motoring with his wife and Miss C. Birles, of Burnage, Manchester; when near Buxton the car plunged over an embankment and both the ladies were killed.

MEDICAL BATHS INSTALLATION.—The Scarborough Corporation opened, on June 27, a municipal medical baths establishment built at a cost of £10,000. Turkish and Russian baths are on the ground floor. Various douche treatments are provided, and the electrical equipment includes a radiant heat reclining bath, high frequency treatment, diathermy, and ultra-violet ray treatment.

FIRES.—An outbreak of fire occurred on June 30 at 41-53 Britannia Row, Islington, London, N., the premises of R. Hovenden & Sons, Ltd., wholesale perfumers. Two large buildings were involved in the outbreak, and the roof of one collapsed.—The Fire Brigade was called recently to 22 High Street, Notting Hill Gate, W., the premises of Lewis & Burrows, Ltd., chemists. The fire was confined to the sun-blind.

BURGLARIES. — The premises of Hartleys, chemists, Accrington Road, Burnley, were broken into a few days ago; a camera and a small sum of money are missing.—On June 22 the premises of H. O. Isaac & Son, chemists, Whiteladies Road, Bristol, were broken into and, it is reported, some "dangerous" drugs were stolen.—During the night of June 27-28, the shop of Mr. W. A. Roberts, chemist and druggist, Yelverton, was broken into and several cameras were stolen.

Scottish News

Brevities

Owing to mistaking a bottle of mercuric chloride tablets for aspirin tablets, Mary G. Miller, Kilsyth, recently died in the local infirmary.

The Lanarkshire Insurance Committee, at a recent meeting in Glasgow, appointed Mr. A. A. Dick chairman and Mr. J. O. Beattie vice-chairman.

Madame Curie recently had the honorary degree of Doctor of Laws conferred upon her by the Glasgow University, and during her visit was also presented with the freedom of the city.

Mr. James Morrison, chemist and druggist, High Street, Newburgh, was recently involved in a motor-cycling accident near Bridge of Earn, Perthshire, and was removed to hospital suffering from concussion.

Mr. T. C. Miller, chemist and druggist, Dunfermline, recently addressed the local rotary club on "Pharmacy." In his opening remarks Mr. Miller made a humorous reference to the old "blunderbuss" bottle of medicine which contained many ingredients.

At the recent ceremony of "riding the marches" at Linlithgow, three brothers, Mr. A. Spence, chemist and druggist (deacon of Fraternity of Dyers), Edinburgh, Mr. W. W. Spence, chemist and druggist (baron), Linlithgow, and Dr. E. Spence, Edinburgh, again took prominent parts.

A correspondent (2/7) writes: "June 28 and 29 are days to be remembered by Scottish chemists, for on these days the *C. & D.* Special Issue was delivered, and what a wealth of information it contains! We have been able only to glance at its pages so far; the solid reading is a treat in store. We have, however, sufficiently perused it to enable us to grasp to some extent the debt we owe to the compilers, Editor, Publisher and staff, whose hearts must have been in their work. Truly the *C. & D.* sets an example to the world in trade journalism as a fine art."

Irish News

Pharmaceutical Reciprocity

Introducing the Home Office vote in the Northern Parliament recently, Sir Dawson Bates, Minister of Home Affairs, referred to the administration of the Pharmacy Acts. The Minister said the Northern Ireland Pharmaceutical Society was established some years ago, and he was happy to say that since its establishment its career had been one of continued success. The number of licences issued during the year 1928 was 397, as against 369 for the year 1927, but the most important feature in connection with its position was that for the first time in the history of pharmacy in Northern Ireland there was now complete statutory authority for reciprocity between the Pharmaceutical Society of Northern Ireland and the parent body in England. This reciprocity also involved reciprocity and recognition as between Northern Ireland and the British Dominions, and he need hardly explain how important a matter it was for the Society and for the future generations of chemists coming from Northern Ireland to know that there was a career open to them, not only in Great Britain, but also in the great Dominions across the sea. In order to effect this scheme of reciprocity, it was necessary to accord to the British Society special legislative powers; and he must, on behalf of the Society, and, indeed, on behalf of the Government and Parliament of Northern Ireland, express to the Committee and officers of the British Society, and to the late Imperial Home Secretary and his Department, their gratification for the willing and courteous way in which they helped to overcome all the difficulties. The Minister also mentioned that the sale of methylated spirits had been stamped out. Mr. Grant: What about Red Biddy? Sir Dawson Bates: Red Biddy is a thing of which I have never yet been able to get an exact definition. As hon. members are aware, this practice was extremely prevalent in certain country districts in our province some time ago, and had a most demoralising effect on those who indulged in it.

Belfast

At the recent Pharmaceutical Preliminary examination at Queen's University, Belfast (matriculation), the following candidates were successful:—Arthur Doran, William H. McAlpine, George Ovens, Douglas F. Stoops.

At Belfast Summons Court, on June 18, the Corporation Shop Hours Inspector had cases against a number of pharmacists and druggists for keeping open after 8 p.m. for the sale of other than medicines or medical and surgical appliances. The following penalties were imposed:—Messrs. Charles B. Jones, Ph.C., Cromac Street, and James Browne, R.D., Woodstock Road. 10s. each; Mr. J. Acheson, R.D., Cromac Street, 5s.; Messrs. Fred. P. Gurd, R.D., Woodstock Road, George Hamilton, Ph.C., Beersbridge Road, J. D. Carse, R.D., Woodstock Road, J. D. Fullerton, R.D., Crumlin Road, F. P. Armstrong, Ph.C., Crumlin Road, and James McKenna, Peter's Hill, 2s. 6d. each.

British Pharmaceutical Conference

THE CHAIRMAN'S ADDRESS

The Changing Foundations of Materia Medica

FROM the earliest times deep confidence has been reposed in medicine, but the use of the remedies adopted by our ancestors was not usually based upon clearly demonstrated action nor upon exact knowledge. During the Middle Ages superstitious practices abounded, and medicine was surrounded by sacred associations. The knowledge of drugs that existed rested chiefly upon custom and tradition, and medical treatment was based on mere empiricism because the action of medical agents on bodily functions was not understood. Our forefathers decided by trial that various substances produced certain effects. From an immense list of such remedies very many of those with no clearly discoverable action have gradually been eliminated, though it would be idle to pretend that our text-books do not include still a number of inactive and useless medicaments. The primitive remedies were composed mainly of vegetable or crude animal substances, but compounds of arsenic, antimony and mercury were in use, and Epsom salts and Glauber's salt were among the earliest recorded inorganic chemical substances used in medicine. The great domain of organic chemistry was the development of a much later age.

MR. R. R. BENNETT, B.Sc., F.I.C., PH.C.,
Chairman of the British Pharmaceutical Conference, 1927–29

In the short time allowed me I propose to attempt to give in bare outline an account of some of the most striking changes in materia medica wrought by progress in chemistry and biochemistry, in physics, in physiology, and in the science and practice of medicine. In spite of the ever-increasing nerve strain which results from modern conditions of business and social life, the health of the nation is to-day maintained at a higher level than ever before in the world's history. Statisticians have shown that a child born to-day has a chance of living at least a decade longer than its grandparents. This improvement of public health is due to advances in hygiene and preventive medicine and to the therapeutic utilisation of various physical means of influencing the tissues and functions of the body, but also it is dependent in no small measure upon the use of some of the modern drugs and medicinal chemicals which are available for the prevention and cure of disease.

The insulin treatment for diabetic persons, the effective use of vitamins in correcting the ills occasioned by deficiencies in our dietary, the value of fresh liver and liver extracts in pernicious anæmia are instances of the recent contributions made by scientific research to medical practice. Nor must we forget the great progress made in the preparation of medicines which help to make the disease-ridden lands, within and without the Empire, safe for the white man. Without these remedies British colonisation and trade in the tropical and subtropical countries, which form so important a part of our great Empire, would be seriously handicapped, and could only be carried on at the cost of many valuable lives. The scourge of the mosquito-born epidemics has taken heavy toll, but these diseases are among those that can now be controlled. Many tropical diseases are caused by the action of parasites, and tropical medicine has been so successful in recent years largely because investigators have realised that it is essential to be in full possession of the life history of the parasite, so that it can be attacked both inside and outside the human body.

ACTIVE PRINCIPLES

I have said that in the past many of the drugs used in the treatment of disease were plant or animal products. The preparations available for administration were not elegant and perhaps not always active. To-day we live in an age of standardised products, while isolated active principles to a considerable extent have replaced the parent drug. Morphine, cocaine, atropine, quinine and emetine are a few of the older well-known examples of the active plant alkaloids which in a large measure have replaced in medical practice the drugs in which they occur. More recently, ergotoxine has been made from ergot on a commercial basis. The alkaloid ephedrine was isolated nearly half a century ago, but only within the last three or four years has it been introduced for the treatment of asthma and hay fever. Ephedrine is obtained from a plant which is mentioned among the materia medica of one of the Chinese emperors over 2,000 years before the Christian era. Down through the centuries, under the name ma huang, it has been a prized ingredient of Chinese folk-medicine. In 1924 interest in ephedrine was aroused by a demonstration of its close chemical and pharmacological relationship with the animal

BRITISH PHARMACEUTICAL CONFERENCE 1929

hormone, adrenalin. On all sides there set in an intensive study of ephedrine. It has only about one-fiftieth the activity of adrenalin, but its action is more prolonged, and it has the further great advantage that it can be administered by the mouth.

Among the achievements of recent years has been the replacement of the active principles of certain natural products by identical substances synthetically produced at a cost which compares favourably with that of the natural article. The price of synthetic thyroxine is half that of the natural product obtained from the thyroid gland. Another case in point is the replacement of natural ephedrine by the synthetic product, but the latter does not possess the same therapeutic activity as the natural alkaloid. It is interesting to reflect that both in the animal and the vegetable world Nature effects her syntheses within a very small range of temperature and with very mild reagents. Fusions with alkali, treatment with powerful dehydrating agents, and sealed tube reactions under pressure are unknown to her. The syntheses of the laboratory are invariably performed in a manner which would destroy the apparatus in which Nature works. Nature also possesses the secret of optical activity and leaves to Art the synthethising of optically inactive forms only, but most of these optically inactive forms can now be resolved.

Synthetic Drugs

In addition to the substances which occur naturally in the vegetable and animal kingdoms there is an enormous number of drugs possessing valuable medicinal properties which are obtained solely by synthetic chemical processes. In dwelling upon the great advances in synthetic chemistry, let me remind you that only a century ago a sharp distinction was drawn between the inorganic and the organic world, but the advance of scientific knowledge broke down the barriers between the animate and the inanimate when it was discovered that organic substances, previously supposed peculiar to the tissues of living beings, could be prepared in the laboratory.

The centenary of the synthesis of urea by Wohler in 1828 has recently been commemorated. Wohler, by heating potassium cyanate with ammonium carbonate, produced the substance urea, which previously had been known only as an important constituent of urine. From the synthesis of urea to that of thyroxine about a century has elapsed, and during that period vast numbers of organic compounds have been synthesised. The natural alkaloid cocaine was for years the leading local anæsthetic, but its toxic properties led to a search for substitutes. As a result many synthetic local anæsthetics have been introduced which are valuable and effective for producing anæsthesia of the conjunctiva, the mucous membrane of the nose, throat and urethra and permitting painless operations in all parts of the body after subcutaneous injections; their toxicity is less than that of cocaine, but, at the same time, their anæsthetising power is also less. Their usefulness depends on the ratio between their toxicity and their anæsthetic power. This group includes amongst others ethocaine, borocaine, eucaine, and stovaine. Avertin, which is tribrom-ethyl alcohol, is the latest addition to the drugs at the disposal of the anæsthetist. A freshly made aqueous solution used per rectum is rapidly absorbed and produces unconsciousness followed by sleep, which helps to diminish the pain following an operation.

A great deal of work has been done also in the development of the use of synthetic dyes in therapeutics. Dyes are absorbed by vegetable and animal cells, and that they have a selective action is shown by their use in microscopy whereby different dyes are made to stain different constituents of the same cell. They also have a selective action on particular bacteria. The study of dyestuffs has been directed to the treatment of disease due to protozoal infections, and some very useful compounds have been discovered. Trypan blue has been particularly successful in the treatment of red water fever in cattle. Some of the dyestuffs first studied for their trypanocidal effects have been found more effective as bactericides, as, for example, acriflavine and auramine. These dyes are of high bactericidal value in the treatment of wounds, and being non-toxic and free from irritant action they do not retard the healing process.

The powerful antiseptic properties of the inorganic salts of mercury have been known for many years, but their field has been limited on account of their destructive action upon animal tissue. The search for an actively antiseptic organic mercury compound which possesses the antiseptic properties of the inorganic mercury salts, and is at the same time free from the disadvantages of the latter, has resulted in the discovery of mercurochrome—the sodium salt of dibrom-hydroxy-mercuri-fluorescein, a dye belonging to the phthalein series. Mercurochrome possesses a powerful antiseptic action on bacteria, and has been found very effective in the treatment of infections of the genito-urinary tract.

Another notable trend is the increasing attention which is being paid to organic compounds of iodine. The adoption of the ammonium salt of ortho-iodoxy-benzoic acid as a specific for arthritis must be noted. Tetraiodophenolphthalein has been successfully applied in *x*-ray technique for cholecystography, while iodo-hydroxy-quinoline sulphonic acid, known as yatren and quinoxyl, has been found useful in the treatment of amœbic dysentery. The control and cure of protozoal diseases by means of various organic compounds of arsenic and antimony is an achievement of outstanding importance. There are numerous arsenical specifics for syphilis, sleeping sickness, amœbic dysentery and other tropical diseases, though the employment of some of these compounds is still in the experimental stage. Antimony compounds have shown an almost equally wide range of usefulness, and the present time has been described as the period of the apotheosis of antimony in tropical medicine.

Chemotherapy

Modern medicine depends so largely upon the synthetic products of the laboratory for defence against disease that some reference must be made to the relationship between physiological action and chemical constitution. Such study as chemists and biologists have made of the influence of chemical constitution on physiological action has shown that a small difference in constitution may profoundly influence activity. However, no simple laws correlating chemical constitution and physiological action have as yet been deduced, and possibly this is not likely until the chemistry of the living body is better known. The science of chemotherapy, or the treatment of infections by the use of synthetic substances, is substantially the outcome of Ehrlich's side-chain theory. Ehrlich advanced the theory that there was an affinity between certain chemical groupings and the protoplasm of micro-organisms, but this theory is fast losing sway, and the view is gaining credence that all the chemotherapeutic substances destroy micro-organisms indirectly by increasing the combative action of the host's protective mechanism.

Recent work has indicated that ultimately disease will come under medical control in a way hitherto quite beyond reach. For this end a much closer alliance between chemical, biochemical, pathological and clinical workers is required. A start has been made in organising chemotherapeutic research through a permanent committee of chemists and biologists, while a separate committee will organise and direct the necessary clinical trials of substances which are likely to be of importance in medicine. The establishment of a chemical research laboratory at Teddington under the general scheme of research directed by the Department of Scientific and Industrial Research must be regarded as an experiment of great interest. This laboratory is working in collaboration with the Medical Research Council in an endeavour to obtain experimental evidence of the relationship between chemical constitution and physiological activity. New compounds produced at the laboratory are considered from the point of view of their possible practical application, and with the facilities afforded by co-operation with the Medical Research Council, compounds likely to be valuable for therapeutic use are tested physiologically.

BRITISH PHARMACEUTICAL CONFERENCE 1929

Organotherapy

The organs, tissues and secretions of animals were extensively employed as medicinal agents in ancient times by the physicians of Greece, Rome and Egypt. The London Pharmacopœias of the seventeenth and early eighteenth centuries contained a wide range of animal products. Now, following a period of comparative disuse, the practice of employing organotherapeutic preparations is again developing. It may be stated on broad lines that modern organotherapy has for its object either the replacement artificially of the internal secretion of a gland which has ceased to function efficiently, or the production of certain effects in other organs. In human beings there are certain diseases which are recognised as being due to lack of secretion of the endocrine glands; among these are cretinism, diabetes, parathyroid tetany and Addison's disease. A variety of other conditions have also been attributed to endocrine dysfunction, and these range from obesity to Mongolian idiocy and the criminal personality. The accomplishments of endocrine therapy in the case of thyroid, pancreas and parathyroid disturbances seem to be little short of miraculous, but one must not be misled by these successes into the supposition that most of the ills of mankind may be benefited by the administration of endocrine products. Many animal products are administered orally, but there is very little evidence that when so taken they all produce a physiological effect. Thyroid and anterior pituitary preparations are notable exceptions, but otherwise the active principles of most of the endocrine glands appear to be destroyed during the processes of digestion. On the other hand, when the gland preparations are administered hypodermically good results can often be obtained. In some cases actual implantation of the fresh gland itself has been resorted to; this is the method followed in the rejuvenescence treatment advocated by Voronoff.

The biological assay of gland products is one of the problems of to-day, for it is obvious that an assay method is essential in the case of compounds of unknown or even known chemical constitution when the manufacture may result in the variable production of inactive or toxic by-products. The standardisation of insulin and posterior pituitary extract is accomplished by comparison with an international standard. Methods of assay and suitable standards for other substances, such as the ovarian hormones and an extract of the parathyroid glands, are still under investigation. Chemists have achieved much by the extraction of specific hormones in a pure form, and this is a line of research which promises still further accurate and positive results. In the case of the suprarenal gland and the thyroid gland the active constituents adrenalin and thyroxine have been isolated and chemically identified. In other instances an active substance has been isolated but has not yet been chemically identified, as, for example, insulin. In some cases the chemical principle which has been isolated is not the sole product of the gland. The thyroid gland secretes something besides thyroxine, and the suprarenal gland something besides adrenalin. The treatment of pernicious anæmia by means of liver extract is definitely established. In a liver extract there is clearly some compound capable of curing a hitherto incurable malady. The isolation, analysis, and perhaps the ultimate synthesis of this compound will form a thrilling theme for some future chairman of our Conference.

Deficiency Diseases

Research has been directed not only to the discovery of substances which attack the symptoms of disease, but also to the investigation of its cause. Goitre, rickets and pernicious anæmia are deficiency diseases, and it has been shown quite recently that puerperal septicæmia should be added to the list. With advancing knowledge it may possibly be found that many other diseases are due to deficiency of one substance or another which the chemist can provide either by synthesis or by preparation from some natural source. The science of the function of the vitamins in nutrition may be said to date from 1912, the year in which Hopkins made known his classical discovery that to maintain animal life the diet must contain, in addition to the substances generally accepted as dietary essentials, a sufficiency of accessory food factors, or vitamins as they were afterwards named. During the years which have passed since 1912, our expanding knowledge of the vitamins has led with increasing conviction to the conclusion that normal health is only maintained if an ample supply of vitamins is present in the diet.

The significance of iodine has been dealt with very exhaustively in the Medical Research Council's recent report on iodine in nutrition. It is shown that iodine stands in a very intimate relation to biological processes, and that neither the animal nor the vegetable world can remain indifferent to its presence or absence. The strongest impression left on the mind by the report is that iodine possesses some fundamental significance for life. Hardly a cell remains indifferent to it; iodine deficiency affects almost every function and every tissue of the body. In certain parts of the country, the soil and the surface waters contain so little iodine that an individual drinking the water and eating vegetables raised on the soil may not receive enough iodine to meet the body's need for this element. When iodine is deficient goitre occurs, and the addition of iodine to the diet in minute amounts is indicated in the case of individuals living in regions where goitre is prevalent. It is natural to think of iodine in connection with the thyroid gland, and while we reckon the iodine content of water and most articles of diet in small fractions of a milligram per kilogram, the human thyroid contains a total of from 10 to 15 milligrams of iodine. The animal body apparently has found it necessary to set aside certain tissues in which the power of collecting iodine, common to all cells, is intensified to a very special degree. An optimal concentration of iodine in the diet increases the supply of thyroxine, thereby stimulating metabolism, and the feeding of small quantities of iodine compounds to livestock is becoming a common practice which is producing beneficial results.

The importance of calcium in all vital processes has also been intensively studied during recent years. Calcium salts exist in the blood and in the tissues, and any interference with the calcium balance leads to serious disturbances. A generation ago we knew but little about calcium metabolism, yet every convalescent patient was fed on fresh milk and eggs, which we now recognise as the main source of calcium in our diet. Vitamin D has the power of regulating calcium metabolism, and the parathyroid hormone also plays an important part in the maintenance of the normal level of blood calcium. Within recent years parathormone has been prepared: this is an extract of the parathyroid gland which, when injected subcutaneously, leads to a marked increase in the calcium content of the blood.

Bacterial Diseases

The living body is able to produce within itself substances which act as a defence against bacterial invasion. The blood serum of healthy animals is naturally bactericidal, and it may be sufficiently powerful in this respect to prevent pathogenic bacteria from establishing themselves in the blood. This is known as natural immunity, but as distinct from this condition, the warding off or the cure of many bacterial diseases can be achieved either by administering to a patient the serum of an animal which has been immunised or by inducing the formation of antitoxins in the patient's body by administering dead bacteria in the form of a vaccine. The origin of the use of vaccines goes back to the days of Jenner, who instituted the method now known as vaccination. Jenner's work showed that cow-pox could be transferred from calf to man, and from man to man; and he proved the validity of the proposition that cow-pox in man diminished the liability to attack by small-pox. In so doing he introduced a method of producing immunity which has since been applied to the prevention and cure of many other diseases. There is a dictum

BRITISH PHARMACEUTICAL CONFERENCE 1929

that the physician of the future will be an "immunisator." Jenner opened a door which is always opening wider. Artificial immunity may be imparted to an animal by inoculation of specific bacteria, or their toxic products, in gradually increasing degrees of virulence. The crowning development of this knowledge is that the blood serum of an immunised animal may be successfully employed for prophylactic, as well as curative, purposes by injection into a human being.

Antitoxic serums are now regularly prepared from the blood of horses which have been immunised against pathogenic bacteria or their toxins, and the activity of some such serums can be accurately standardised. Antitoxin treatment is now accepted as being of the utmost value for protection against or cure of diphtheria, tetanus, cerebro-spinal meningitis, scarlet fever and other diseases. In the case of diphtheria the mortality has been reduced to a very low percentage by the use of an antitoxin in massive doses, by which is effected the neutralisation both of the toxin circulating in the blood and that which has become fixed by the tissues. In epidemics of whooping-cough cases may prove fatal if inoculation is neglected. This may occur particularly in cases where the children are weak, or if they are suffering from some specific disease, such as tuberculosis, when the whooping-cough occurs. Inoculation with whooping-cough vaccine will often prevent an attack of the disease, while in cases in which the attack is not prevented, inoculation causes the disease to run a mild course. Further, the value of a protective vaccine against acute intestinal diseases, such as typhoid fever and cholera, is well known, particularly in cases in which the vaccine is used before a visit to the tropics.

Diseases of the respiratory organs are probably the most prevalent and widespread of all diseases affecting the human race. Although they are more prevalent in the colder climates, yet no country is free from them, and nobody possessess complete natural immunity. They are seasonal in character, and for the most part they thrive best in cold, damp climates, but also under the changeable conditions prevailing in tropical and sub-tropical countries they can be very severe. They reduce the efficiency of the individual, and often they are a serious trouble to the community. The most widespread of these diseases are the common cold and influenza. Ventilation, an open-air life and good food are stated to be the great enemies of these diseases, but the value of vaccine therapy, when employed before the onset of the season during which they are most prevalent, is now recognised, and many physicians have adopted it extensively.

The control of canine distemper must be mentioned as a notable achievement, while the knowledge thus gained has already proved to be of assistance in the attack upon the problems of virus diseases in general. It has been established that distemper is due to a filter-passing, ultra-microscopic virus present in the blood, and also in the nasal discharge which is so prominent a symptom. The result of the researches so far is to secure vaccines from the tissues of infected dogs, which protect other dogs from contracting the disease when in contact with those suffering from it. Evidence is lacking as to the duration of the immunity conferred, but in experimental comparisons between inoculated and uninoculated dogs the results so far have been strikingly successful. The vaccine is not yet available to the dog-owning public in general, but arrangements for its large-scale production on a commercial basis are in progress. A recently published report of the Medical Research Council states that within the last few months evidence has shown that the study of virus diseases has already had a usefulness far beyond that of controlling canine distemper. The recent work of the Rockefeller Commission in West Africa has revived and confirmed an older view that yellow fever is a virus disease. Preventive inoculation against this highly dangerous disease has proved to be successful in Brazil in stamping out a local epidemic. The importance to West Africa especially, and to the Empire as a whole, of any effective means of controlling yellow fever is a matter which can scarcely be exaggerated.

The Cancer Problem

Science is now playing no small part in the attack on the cancer problem, both from the standpoint of the direct cause of the disease and its treatment, though unfortunately public opinion appears to have been set into a fixed belief not only that there is no cure for cancer, but that there never will be one. This attitude is much to be deplored, and is partly responsible for the apathy and despair with which even the earliest cancers are regarded; too often as a result advice is not sought in the early stages of the disease, and the sufferer consults a doctor only when driven to do so by sheer necessity. Some experts are now definitely in favour of the view that the cause of cancer is an ultra-microscopic virus. The problem of the nature of the ultra-microscopic viruses is perplexing, but it is a convenient working hypothesis to regard them as being analogous to visible bacteria, the difference being one of dimension only. The cancer virus, however, appears to differ essentially from the viruses causing epidemic disease, inasmuch as it produces a local disease belonging to an individual. Further, in the case of the virus of foot-and-mouth disease, or canine distemper, or measles, it is necessary to start with the disease in question, but in the case of cancer virus one need not necessarily start with the tumour. The tumour can be made to begin by irritating the tissues; hence the virus must be present universally, but is only active under certain suitable conditions.

The knowledge that some chemical substances have a selective action upon certain cells, comparable with the selective action of dyes, has been used by those who have tried to find a substance which will be deadly to cancer cells, and not to the normal cells of the body. Lead has been adopted for the chemotherapeutic treatment of cancer, and although the clinical utility of lead is not accepted by all, it is acknowledged by many that good results have been obtained from intravenous or intramuscular administration of various compounds of lead. Some clinicians have advocated the use of a colloidal suspension of metallic lead; others have adopted colloidal lead phosphate, while more recently colloidal lead iodide and colloidal lead selenide have been favourably mentioned. Lead is lethal to the micro-organism, but unfortunately it cannot be considered innocuous to the individual.

Much progress has been made in recent years in applying the properties of radium to the treatment of cancer. Radium was discovered in 1898, and although soon after the element had been isolated its destructive action on the human tissues was noticed, the therapeutic possibilities of radium were not at first recognised. To-day it is safe to say that most persons suffering from early cancer can have the disease removed by a course of radium treatment as surely as by the knife, and with less suffering and risk. Definite technical methods have been worked out, and radium is now applied to almost every type of growth, and in almost every region where cancer develops except the stomach. The results gained have put it beyond doubt that in radium surgeons possess an invaluable auxiliary weapon by which much mutilation can be avoided and by which life may be prolonged or saved. There is at present a wholly inadequate supply of radium in the country, and we may not yet hold the key to the cure of cancer, but a solution of the problem seems to be appreciably nearer. The report of the Radium Subcommittee of the Committee of Civil Research has recently been issued as a Parliamentary Paper. The outcome of this report is that we are about to spend a vast sum of money, contributed partly from the public funds, on the purchase of an additional supply of radium for medical purposes.

Progress and Research

To endeavour to compass, even in outline, a complete survey of the advances in knowledge which have effected our calling during the last hundred years, or even since the Conference last assembled in Dublin, is to attempt the impossible. The achievements are stupendous, and

BRITISH PHARMACEUTICAL CONFERENCE 1929

they represent a vast saving of human suffering. The advancement of every science depends upon the persistent and relentless toil of its research workers, and there is alive to-day a spirit of enthusiasm and energy which cannot fail to achieve great things. Happily for research in general the Governments in most countries are becoming increasingly aware of their obligations in regard to the provision of adequate funds, but the public must be better informed if it is to appreciate to the full the need for more and more research; it cannot appreciate what it does not understand.

We must assist in dispelling the idea, which may still exist in the mind of the public, that science is mere legerdemain, and that its mysticism is heightened by a rigmarole of complex terminology. Without wide publicity there cannot be a general appreciation or a proper understanding of what science has achieved and what it may achieve in the future for the good of mankind. I will conclude by quoting from a leading article in a recent issue of one of our best known scientific journals in which readers were reminded that a great statesman had said that learning is less aggressive than it was fifty years ago, because scientific men realise more the limitations of their own work. Knowledge, like a particle of radium, is in a state of rapid disintegration; no sooner do we begin to understand an accepted explanation than it is obsolete. There is no finality. Life itself is like a greyhound race, but without a dog's chance of catching the electric hare; it runs in a groove which we call the laws of nature, and is controlled by an intelligence, remote and inscrutable. Happily, however, the work of helping the world forward does not wait to be done by perfect men, and every addition to the store of scientific knowledge serves as a stepping-stone to further discoveries.

Vote of Thanks

The PRESIDENT (Mr. L. Moreton Parry): I see by your applause how you appreciate the address. All present must admire the clear dictum, great language and charming personality of the speaker. (Applause.) I will now call upon another distinguished scholar, Dr. Claridge Druce, to express his appreciation. (Applause.)

Dr. DRUCE said that it was perhaps in the nature of things that the oldest vice-president present should utter some words of congratulation to the chairman. He thought it was the largest-attended conference they had had. It was a great pleasure to hear in such clear and lucid language such an exposition on pharmacy which would give them thought for the future. Although there were many points in it suggestive of discussion, it was one of the great benefits enjoyed by this address that discussion on it was never allowed. The chairman was free from that—(laughter)—a privilege which some of them might like to possess, but he was certain that the chairman had acquired the highest esteem of all present. (Applause.) He remembered hearing Mr. Spender referring to the importance American newspapers attached to headlines, and he gave an anecdote to bear that out. A certain minister in New York gave a sermon on the future world, depicting in glowing language the pleasures and joy of a certain section, and then in equally and painful but more lurid language he depicted the horror of the other place—(laughter)—and he said in conclusion something to the effect that the pavement of the higher regions, they were told, consisted of good intentions, however, he said, the pavement of the lower regions was composed of different material made up of bridge cards, cigarette ends, and slippers from the variety stage. (Laughter.) The "New York Herald" appeared with the headline "Oh, death, where is thy sting." (Laughter.) He expected to see in the Irish papers to-morrow something like this: "Bennett raises Pharmacy." (Laughter.) He had done so by this very thoughtful and valuable address. Twenty-eight years ago it was suggested in the presidential address that radioactivity would have a great future, and after a while the world discovered, and saw to what extent radium, an unknown element, had become. They would remember that in the discovery of nitrogen there was a certain indeterminate material, and then Lord Raleigh discovered argon, an unknown gas, to be followed with helium, by Professor Ramsay. This was found to be extremely useful in connection with flying, and then followed the discovery of neon. What of the discoveries of the next twenty-five years. He could only say that they were in the lap of the gods, or he would rather say that they were in the lap of the goddesses, for the latter were, after all, a large proportion of the English-speaking race. "God bless them, and God bless you." (Applause.)

The PRESIDENT said that having heard the voice of Oxford, they must now hear Cambridge. (Laughter and applause.)

Mr. E. SAVILLE PECK seconded the vote of thanks which had been proposed by such an eminent scientist as Dr. Druce. (Applause.) He remembered his (Dr. Druce's) year of office as president of the Conference at the last meeting in Dublin, and since then he had gone on achieving and collecting to himself honour after honour, and within the last two or three years he had received that blue ribbon of science, the Fellowship of the Royal Society. (Applause.) They had had in the address an almost cinematograph résumé of the progress that medicine had made for the alleviation of human suffering. They must see to it that they kept pace with medical progress and knowledge. They looked to Mr. Bennett, remembering what he had done in the past on the Board of Examination and Science Committee, and considering also his twelve years' work as honorary secretary of the Conference, and two years' work as chairman, knowing all that, and considering his important position for the production of the new British Pharmacopœia, they looked forward to yet greater work in the future. (Applause.) The Pharmaceutical Society had brought the pharmacological laboratories into being, and work on research was being carried out under the able direction of Dr. Burn. In this way the Society was well to the front. Mr. Bennett had used the words "Materia Medica" in a wider sense than that of the examination room. It was really cognisant of the whole material used in medicine, and was not only applicable to the study of vegetable drugs. The address had been most stimulating and in language all could understand. He hoped that every success would be with Mr. Bennett in the future. (Applause.) This was no formal vote of thanks, but their hearts went out to him in deep gratitude. He had lifted all the aspects of pharmacy out of the spirit of commercial competition and vexatious regulations, put it upon a plane which would rank with those forces which were making for the alleviation of human suffering. (Applause.)

The PRESIDENT said that he did not think that there was any question about the fact that Mr. Bennett was one of the most popular chairmen they had ever had.

The vote of thanks was carried with acclamation.

The CHAIRMAN, acknowledging, said he was conscious and grateful for the sincere way in which the vote of thanks had been moved, seconded and carried. They were reminded that Dr. Druce was President of the Conference in 1901, and it was a delight to have him with them that day. (Applause.) Dr. Druce was not only a pharmacist, but one of the most distinguished botanists of this age. (Applause.) He enjoyed an international reputation, and for his work had, as Major Peck reminded them, been awarded with the great honour of being elected to a Fellowship of the Royal Society. (Applause.) He thanked them once more, and if he had succeeded in putting on record in his address something of interest to the members of the Conference he was more than gratified, and now he could say to the ladies that he thought the worst part of the morning was over. (Laughter and applause.)

APOLOGIES for absence were received from Messrs. R. Feaver Clarke, R. Bremridge, W. A. H. Naylor, E. M. Holmes, W. Kirkby, F. Ransom and J. Rutherford Hill. The last-named had arrived in Dublin, but had been recalled owing to a family bereavement.

British Pharmaceutical Conference

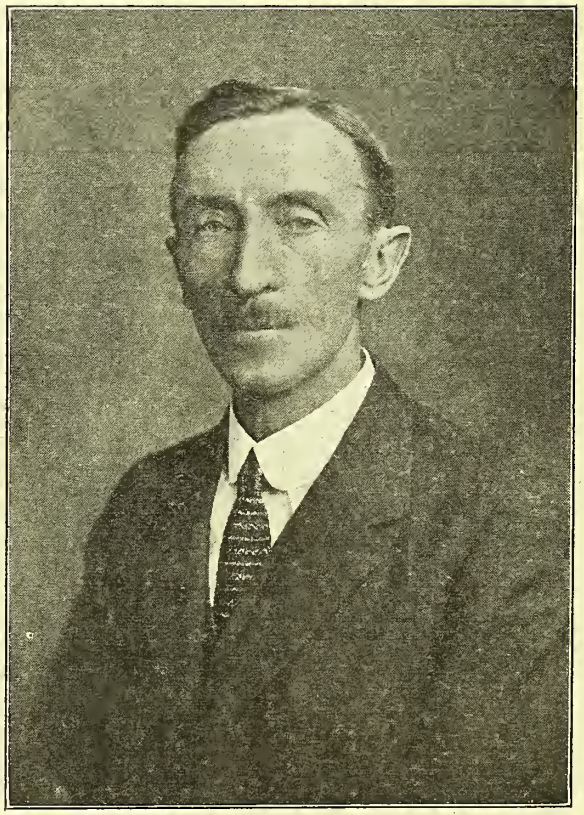
WHO WERE THERE

The following is the official list of members attending the Conference as on June 21 :—

Adams, Miss E., London
Antcliffe, H., Sheffield
Antcliffe, Mrs. H., Sheffield
Anderson, D., London
Anderson, J., Dundee
Armitage, N. N., Leeds
Armitage, Mrs., Leeds
Arthur, H. P., Glasgow
Ashworth, T., Liverpool
Ashworth, Mrs., Liverpool
Aspell, James, Bath
Attwood, A. A. S., Alexandria, Egypt
Attwood, Mrs., Alexandria, Egypt

Bain, Miss M. McD., Glasgow
Baldry, R. E., London
Barragry, F. J., Dublin
Bayes, Geo. R., London
Beardsley, W., Woodford Green
Beardsley, Mrs., Woodford Green
Bell, W. A., Southsea
Bellamy, W. A., Barnsley
Bennett, R. R., London
Bennett, Mrs., London
Bennett, R. P., London
Berry, H., Birmingham
Berry, Mrs., Birmingham
Birnie, J., Dublin
Blackburn, Miss, Guildford
Boag, Miss M. G., Edinburgh
Bolton, Miss M., Hull
Boyes, Miss M., London
Brackenbury, W. R., Middlesbrough
Brackenbury, Mrs., Middlesbrough
Bradbury, A. E., Dublin
Brady, P. A., Dublin
Brady, Mrs., Dublin
Bream, H. N., Dublin
Bream, Mrs., Dublin
Brewis, E. T., London
Briggs, Geo. W., Sutton-in-Ashfield
Briggs, Mrs., Sutton-in-Ashfield
Brindle, E., Edinburgh
Brindle, H., Manchester
Brindle, Miss, Edinburgh
Brindle, Mrs., Manchester
Brindle, Miss, Manchester
Brinson, W. N., Liverpool
Broad, H. C., London
Broad, Mrs., London
Brooke-Kelly, P., Enniscorthy
Browne, F., London
Browne, Mrs., London
Browne, E. N., Mitcham
Browne, Mrs., Mitcham
Brown, R. B., Dublin
Brown, Mrs., Dublin
Brown, Geo., Dublin
Brown, W. S., Glasgow
Brown, Mrs., Glasgow
Byran, D. A., Penmaenmawr
Byrant, Dr. E. G., Aberdeen
Byrant, Mrs., Aberdeen
Bullions, J., Pelaw
Bullions, Mrs., Pelaw

Caine, J. C., Birkenhead
Caine, Mrs., Birkenhead
Caine, Miss Mona, Birkenhead
Cameron, L., Seaford
Cameron, Miss I., Seaford
Campbell, R. E., Dublin
Cane, W. E., London
Cane, Mrs., London
Carr, E. C., Nottingham
Carr, Mrs., Nottingham
Carter, J. C., London
Carter, Mrs., London
Chalmers, W., London
Chalmers, Mrs., London
Chaloner, F., Preston



Photo] [*Lafayette*

HIS EXCELLENCY THE GOVERNOR-GENERAL OF THE IRISH FREE STATE, THE RT. HON. JAMES MCNEIL

Chapman, W., Shotts
Chorleton, A. F., Leicester
Clarke, H. Burton, Cheltenham
Clarke, Mrs., Cheltenham
Clement, H. E., Hampton Hill
Clement, Mrs., Hampton Hill
Cleworth, J., Manchester
Cleworth, Miss E., Manchester
Colwell, Miss L., Southsea
Conder, R. E., London
Conder, Mrs., London
Connor, J. E., Newry
Conyngham, W. B., Dublin
Conyngham, Mrs., Dublin
Conyngham, H., Dublin
Cook J., Norwich
Cook, Mrs., Norwich
Corfield, C. E., London
Costello, T., Dublin
Costello, Mrs., Dublin
Coull, Dr. G., Leith
Coull, Mrs., Leith
Coull, Miss, Leith
Coupar, J. B., Dundee
Coupar, Mrs., Dundee
Cronin, J. J., Dublin
Cross, Miss E., London
Crossley-Holland, Dr. F. W., Leighton Buzzard
Culbert, W. S., Airdrie

Daniels, M. L., Nottingham
Daniels, Mrs., Nottingham
D'Arcy, M. M., Tipperary
D'Arcy, Miss G., Tipperary
Darling, G. W., Southsea
Davies, G., Dublin
Davies, J. H., Dublin
Deacon, W., Bridgwater
Dinning, H., Washington Station
Dinning, Mrs., Washington Station
Dixon, W. L., London
Dobson, A., Blackburn
Dobson, J., Hounslow
Dobson, Mrs., Hounslow
Dow, W. B., London
Dowling, P. J., Dublin
Downing, James, London
Downing, Mrs., London
Doyle, T. J., Dublin
Doyle, Mrs., Dublin
Duff, P. M., Glasgow
Duggan, James, Dublin
Duncan, Miss J., Manchester
Duncan, Miss, Dundee
Dunn, W. R., Northampton
Dunn, R. W., Chester
Dwyer, J. T., Dublin
Druce, Dr. G. Claridge, Oxford
Devlin, P. J., Thurles
Dodd, J. P., Dublin
Devane, Jas., Dublin

Eason, S. B., Cardiff
Eastland, C. J., London
Ellis, W. F., London
Elmes, E. T., Cork
Elmes, Mrs., Cork
Elmes, Miss, Cork
Evans, D. H., Liverpool
Evans, A. C. C., Dublin

Fairhurst, Mrs., Wigan
Falding, W. B., London
Faraday, W. B., London
Fernando, Mrs., Chester
Ferrier, Miss, Dundee
Fielding, P. J., Cork
Fielding, Mrs., Cork
Fielding, Miss Ita, Cork
Fisher, Miss, Highbridge
Fitzhugh, Miss, Nottingham
Fitzpatrick, F. J., Dublin
Fitzpatrick, Mrs., Dublin
Fitzpatrick, Miss, Dublin
Flatman, F. J., Hove
Foden, T. H., Birmingham
Forster, N. E., Monkseaton
Forster, H. S., Carshalton
Foster, Mrs., Carshalton
Fouracre, R., London
Fox, Major C. W. N., London
Fox, Thos. B., London
Fox, Mrs. A. M., London
Francis, A., London
Franklin, J. H., Manchester
Frankln, Mrs., Manchester
Franklin, A. J., Brighton
Freke, Mrs. A., Streatham
Furniss, A. S., Liverpool
Furniss, Mrs., Liverpool
Fyffe, Miss E., Dundee
Fyffe, J. S., Dublin

Gannon, Wm., Maryboro'
Gannon, Mrs., Maryboro'
George, Ernest, Walsall
George, Mrs., Walsall
Gibson, S., Belfast
Gibson, Mrs., Belfast
Gilbert, J. S., Swansea
Gilbert, Mrs., Swansea
Gilleghan, H., Leeds
Gilmour, J., Dunfermline
Gilmour, Mrs., Dunfermline
Gleeson, P., Bruff
Gorry, Jos., Naas
Gower, John, Llanelly
Grant, P., Rock Ferry
Grant, Mrs., Rock Ferry
Grantham, H. G., Dublin
Gray, Wm., Walthamstow
Gray, Mrs., Walthamstow
Grier, James, Manchester
Grier, Mrs., Manchester
Grier, Miss F., Manchester
Grimes, H. C., Dublin
Grimes, Mrs., Dublin

BRITISH PHARMACEUTICAL CONFERENCE 1929

Groves, R. J., Belfast
Groves, Mrs., Belfast
Guiler, J. R., Belfast
Guiler, Mrs., Belfast
Guthrie, Mrs., Glasgow
Guthrie, Thos., Glasgow

Hague, S. W., Cardiff
Hales, G. W., Ipswich
Hallett, W. J., Bath
Hallett, Mrs., Bath
Hampshire, Dr. C. H., London
Hanna, V. E., Dublin
Hanna, Mrs., Dublin
Hardy, W. J., Belfast
Hardy, Mrs., Belfast
Hardy, Thos., Maryport
Hardy, Mrs., Maryport
Harley, Thos., Perth
Haworth, E. B., Great Harwood
Haworth, Mrs., Great Harwood
Hay, Wm. F., Aberdeen
Hayes, Miss Dennis, London
Hayley, N., Dublin
Hegarty, Q. L., Dublin
Hemming, F., Southsea
Henchie, Wm., Dublin
Henneman, I., London
Henneman, Mrs., London
Henry, Prof A., Dublin
Hewitt, C. H., Sheffield
Hewitt, Mrs. Sheffield
Hewson, G., Ballina
Hewson, Mrs., Ballina
Higgs, A., Kingston-on-Thames
Higgs, Mrs., Kingston-on-Thames
Highfield, F. C., Nottingham
Highfield, Mrs., Nottingham
Hill, J. Rutherford, Edinburgh
Hills, F. W., London
Hindle, Fred., Sheffield
Hindle, Mrs., Sheffield
Hines, F. G., York
Hirst, H. M., Scarborough
Hooper, D., London
Hosford, Miss S., Dublin
Howard, D. Lloyd, Ilford
Hughes, M. S., Liverpool
Hughes, Mrs., Liverpool
Hughes, Miss M., Liverpool
Humphrey, J., Harrow

Irvine, P., Chelsea
Irvine, Mrs., Chelsea

Jack, James, Arbroath
Jack, Mrs., Arbroath
Jacks, Fred., Stone
Jacks, Mrs., Stone
Jackson, R. E., North Shields
Jackson, Mrs., North Shields
James, Percy, Cheltenham
James, Mrs., Cheltenham
James, E. B., Liverpool
Jenkin, A. H., London
Johnston, H. A., Larne
Jones, J. E., London
Jones, Mrs., London
Jones, H. Humphreys, Liverpool
Jones, Mrs., Liverpool
Jones, T. S., Rock Ferry
Jones, Mrs. M. P., Liverpool
Jones, A. J., Runcorn
Jones, T. W., London
Jordan, C. J., Exeter
Judge, T. J., Wakefield
Judge, Mrs., Wakefield

Keall, John, London
Keall, Mrs., London
Keogh, I. T., Dublin
Keogh, Mrs., Dublin
Keogh, Dr. Myles, Dublin
Kerr, J. J., Clones
Kidney, R. J., Dublin
Kieran, M. J., Drumshambo
Kieran, Mrs., Drumshambo
Kieran, Miss M., Ballyconnoll
Kieran, P., Ballinamore
Killacky, P. J., Dublin
King, F. H., Westcliff-on-Sea
King, Mrs., Westcliff-on-Sea
Kirkpatrick, D. L., Belfast
Knowles, A., Sheffield
Knowles, Mrs., Sheffield
Knox Mawer, G. R., Wrexham
Knox Mawer, Mrs., Wrexham

Larkin, P. D., Drogheda
Larkin, Mrs., Drogheda
Lawman, F. A., Chester
Lawman, Mrs., Chester
Lawrence, A., Liverpool
Lawrence, Mrs., Liverpool
Lescher, T. E., Liverpool
Lester, L. W., London
Lester, Mrs., London
Lester, A. R., Cork
Lester, Mrs., Cork
Lewis, D., Manchester
Lewis, Miss, Manchester
Linstead, H. N., London
Linstead, Mrs., London
Liston, P., Limerick
Liston, Mrs., Limerick
Lloyd, H. O., London
Lovell, Miss M., Leicester
Lynch, Miss C. K., Hastings

Maben, Thos., London
Mackenzie, D. G., Glasgow
Mackie, H. B., Brighton
Mackie, Mrs., Brighton
Mac Sweeney, E., Cork
Mac Sweeney, Mrs., Cork
Mallinson, G. A., London
Marchant, D., Eastbourne
Marns, Thos., London
Marns, Mrs., London
Marshall, H. H., Birmingham
Marshall, Mrs., Birmingham
Marshall, Miss, Birmingham
Martin, T. O., Gloucester
Mayne, A., Cork
Mayne, Mrs., Cork
McBride, A. C., Armagh
McCauley, S., London
McCormack, J., Wexford
McDonald, A., London
McDonald, Mrs., London
McKeevor, J. V., Dublin
Meagher, F., Dublin
Melhuish, A. R., London
Melhuish, Mrs., London
Merrin, A. C., London
Merrin, Mrs., London
Miles, J. H., Dublin
Miles, Mrs., Dublin
Milner, Jonah, Greenwich
Milner, Mrs., Greenwich
Milner, Miss G., Greenwich
Mitchell, D., Inverness
Mitchell, Dr. J. A., Dublin
Monaghan, J. E., London
Morley, H. T., Stockport
Morrow, Mrs., Dublin
Mullan, M. J., Armagh
Mumford, H. S., London
Mumford, Mrs., London
Mumford, H. A., London
Mumford, Miss Cherry, London
Murphy, H. M., Macroom
Murphy, Wm., Dublin
Murphy, Mrs., Dublin

Neve, H. C., London
Neve, Mrs., London
Noble, Charles A., London
Noble, Mrs., London
Nugent, D. J., Dublin
Nugent, Mrs., Dublin

O'Byrne, Mrs. J. P., Dublin
Officer, H. S., Stockport
O'Flanagan, Miss L., Dublin
Oliphant, A. H., Dublin
Oliphant, Miss M., Dublin
Oliver, J., Hull
Orchard, Fred., Highbridge
Orchard, Mrs., Highbridge
Owen, R. C., Chester

Parry, Miss E., Bristol
Parry, L. Moreton, London
Parry, Mrs., London
Peck, E. Saville, Cambridge
Penty, Geo., Bradford
Penty, Mrs., Bradford
Perkins, Miss M., Leicester
Perrett, F., London
Perrett, Mrs., London
Philips, F. D., Haverfordwest
Phillips, Sidney, Wolverhampton
Phillips, Mrs., Wolverhampton
Pitt, Arthur, Waterford
Plowright, John, Brighton
Plowright, Mrs., Brighton
Potter, Wm., London
Price, E. G., London
Price, Mrs., London
Price, Miss, London
Prince, Miss F. B., Nottingham
Prior, J. S., Stamford
Prior, Miss Olive, Stamford
Purdie, Miss I. A., Edinburgh

Radford, P. J., Cheltenham
Radford, Mrs., Cheltenham
Ramsey, Miss L. C., Glasgow
Reed, J., London
Rees, D. A., London
Rees, Mrs., London
Ridge, F. R., Dublin
Robertson, D., Dundee
Robertson, Mrs., Dundee
Robinson, Sir Thomas W., Dublin
Robinson, Fred., Dublin
Robinson, Mrs., Dublin
Roche, A. F., Dublin
Roche, J. J., Dublin
Rogers, Miss G., Whitley Bay
Rowland, G. H. C., Edinburgh
Rowland, Mrs., Edinburgh
Rowsoll, P. F., Exmouth
Ryan, P., Boyle
Ryan, Dr. M. L., Dublin

Scholes, W. I., Eccles
Scott, T. C., Dublin
Scott, J. R., London
Shattock, Miss M., Lancaster
Shannon, Lieut., Cork
Sheppard, W. J., Barnstaple
Short, G. R. A., London
Short, Peter, Troon
Simmons, E. H., Salford
Simmons, Mrs., Salford
Simon, J. T., Leeds
Simpson, Charles, Aberdeen
Skinner, H., London
Slingsby, E., Leicester
Smith, F., Birmingham
Smith, Mrs., Birmingham
Smith, Miss M. A., Birmingham
Smith, J. de C., Norwich
Smith, Mrs. J. de C., Norwich
Smith, John, Dublin
Smith, Mrs., Dublin
Smith, Dr. Isobel, Dublin
Smith, A. Nutter, Nottingham
Smith, T. J., Dublin
Spronll, Miss R., London
Stainer, J. W., Folkestone
Stelfox, J. A., Birkenhead
Stelfox, Mrs., Birkenhead
Stiles, P. C., Market Harborough
Stiles, Mrs., Market Harborough
Storey, Miss I. F., Dublin
Storey, F., Belfast
Storey, Mrs., Belfast
Street, Miss H. R., London
Sumner, H. J., Dublin
Sumner, Mrs., Dublin
Swann, A. J., Dublin
Swanston, W. E., London
Sweatman, Miss M., Gillingham

Tocher, G. A., London
Taylor, S., Derby
Thomas, H. W., Glasgow
Thomas, Mrs., Glasgow
Thomas, J. J., Kenilworth
Thomson, W. J., Cheltenham
Thomson, Mrs., Cheltenham
Tibbett, H. G., London
Tibbett, Mrs., London
Timoney, M. J., Dublin
Todd, Horatio, Belfast
Todd, Mrs., Belfast
Todd, Miss Mia, Belfast
Toher, T., Sligo
Toy, H. G., Derby
Tucker, W. T., Lewisham
Tucker, Mrs., Lewisham
Twigg, J. G., Withernsea
Twigg, Mrs., Withernsea
Twivey, A., Birmingham
Tyler, A. T., London
Tyler, H. C. S., Leicester
Tyler, B., Redhill
Tyler, Mrs., Redhill

Vallance, A. C., Mansfield

Walmsley, J. R., Manchester
Walmsley, Mrs., Manchester
Walsh, Dr. J. A., Dublin
Walsh, J. S., Dublin
Walsh, Mrs., Dublin
Walsh, T., Prescott
Walsh, J. A., Dublin
Wallbridge, W. G., Liverpool
Wallbridge, Mrs., Liverpool
Walters, J. T., London
Walters, Mrs., London
Warlow, Miss D., Bristol
Warwick, D., Dublin
Warwick, Mrs., Dublin
Watt, M. K., Aberdeen
Watt, Mrs., Aberdeen
Weir, A. S., Kenmay
Wells, F. G., London
Wells, Mrs., London
Wells, W. G., Maidstone
White, Miss, Sutton-in-Ashfield
White, James A., Shipley
White, Mrs., Shipley
Wickham, T. B., Cheltenham
Wickham, Mrs., Cheltenham
Williams, D. J., Bath
Williams, Mrs., Bath
Williams, Miss, Barry
Wilson, F. C., Bradford
Wilson, W. E., Belfast
Wilson, Mrs., Belfast
Wilson, Thos., Burntisland
Wilson, Miss, Burntisland
Wilson, Miss Netta, Burntisland
Winch, Miss Hope C. M., Sunderland
Winchester, C. P., Upminster
Winchester, Mrs., Upminster
Winchester, Miss, Upminster
Windwood, P. S., Shepherd's Bush
Windwood, Mrs., Shepherd's Bush
Winstanley, T. H., Wigan
Winstanley, Mrs., Wigan
Wood, L. G., Deganwy
Woodhead, G., York
Woolls, V. J., Margate
Woolls, Mrs., Margate
Wynter, Miss, Eastbourne

Young, A. E., Leicester

DESIGNS FOR COMMERCIAL BUILDINGS.—An exhibition of architectural drawings submitted in competition under the auspices of the Incorporated Association of Architects and Surveyors for the front of a typical commercial building is to be held at 1 Wilbraham Place, Sloane Street, London, S.W., from July 10 to July 20 (excepting Sundays). Admission is free on presentation of tickets, which are obtainable from the secretary of the Association at the address given.

SOME PHOTOGRAPHS TAKEN

The Conference photographs in this issue were specially taken for THE CHEMIST AND DRUGGIST during the Dublin meeting (with the exception of No. 13, which is by Mr. Davis, Dublin) by Mr. John Cleworth, chemist and druggist, 56 Ducie Street, Manchester, from whom copies can be obtained at 1s. each, post free.

1. A group of pharmacy teachers at the Garden Party.
2. B.P.C. visitors at Dublin Castle.
3. Some Brighton and Cheltenham B.P.C. visitors.
4. A Masonic affair.
5. A Merseyside group, with the president of the Pharmaceutical Society (Mr. L. Moreton Parry) in the centre.
6. *Left to right:* Commissioner Hernon, Sir Thomas Robinson, Commissioner Seamus Murphy, Mr. F. J. Fitzpatrick, Commissioner D. W. Dwyer.

DURING THE CONFERENCE WEEK

7. A group of National Association of Women Pharmacists.
8. Sheffield delegates.
9. A South-East London group.
10. A group of the Local Committee.
11. Mr. P. James, Dr. Claridge Druce, Mr. H. B. Clarke, taken on arrival at the opening of the Conference.
12. The presidents. *Left to right:* Mr. F. J. Fitzpatrick (Pharmaceutical Society of Ireland); Mr. L. Moreton Parry (Pharmaceutical Society of Great Britain); Mr. W. J. Hardy (Pharmaceutical Society of Northern Ireland).
13. Representative delegates of the Conference visit the Dail (Parliament House) as guests of Dr. Myles Keogh.
14. Some Scottish delegates and friends.
15. A group of delegates from Manchester and Salford.

British Pharmaceutical Conference

THE SOCIAL SIDE

The excursion round the Hill of Howth took place on Tuesday. Participants were conveyed to Amiens Street Station, where a special train took them to Sutton. Here tramway cars carried the party to the summit of the peninsula of Howth. The afternoon was bright and visibility was good, so that an excellent view was commanded of Dublin Bay, with the places on the southern side, Monkstown, Dún Laoghaire Harbour, Dalkey and Bray. Tea *alfresco* was very welcome, and after lazing on the Hill the visitors made the return journey by tram to Howth, and thence by train to Amiens Street.

* * * *

On Wednesday morning while Mr. M. V. Sargent was doing some propaganda on behalf of Irish indigenous drugs at a science meeting, and Mr. Herbert Skinner expatiated on an Imperial qualification for pharmacists, the ladies were taken sight-seeing in Dublin. The charabancs left from Kildare Street, and the tour commenced with a visit to Trinity College. The library and museum were visited, where were seen the ancient Book of Kells and the Harp of Brian Boroimhe (1014), the latter reputed to be over 900 years old, a fac-simile of which appears as a trade mark on the well-known buff labels of a celebrated Dublin beverage. Dublin Castle, now occupied as Government offices and law courts, was next visited, and then St. Patrick's Cathedral, one of the most interesting edifices in Dublin, with numerous monuments of celebrities and its intimate association with Dean Swift, and then Christ Church Cathedral. After that the party were driven through Phœnix Park and saw the Viceregal Lodge, the Zoological Gardens (from outside), the Irishman's National Valhalla—Glasnevin Cemetery—and returned to the Mansion House for lunch, passing the National Library, Museum and Government buildings.

* * * *

The garden party at the Zoological Gardens, Phœnix Park, given on Wednesday afternoon by the directors of Boileau & Boyd, Ltd., was attended by some 850 visitors, including :—Dr. McGuinness, Dr. Ashe, Sir J. W. and Lady Moore, Dr. Vincent Tighe, Dr. and Mrs. Lowe, Sir Thomas Robinson, Mr. and Mrs. Louis Webb, Mr. Edmund Webb, Mr. and Mrs. Adam Lloyd Blood, Mr. and Mrs. W. B. Conyngham, Mr. and Mrs. James Montgomery, Dr. Mitchell, Mr. P. J. and Mrs. Lawrence, Dr. and Miss Drury, Mrs. Wisdom Hely, Dr. W. F. and Mrs. Hooper, Lady and Miss Vanston, R. Deane Bolton and Mrs. Bolton, Mr. and Mrs. W. H. Boyd, Mr. and Mrs. Adams McConnell, Dr. Eileen A. Boyd, Miss Boyd, Rev. Father Frewen, Rev. H. D. and Mrs. Forde. Refreshments were provided and brilliant sunshine added to the enjoyment. A programme of music rendered by the band of Garda Siochana (Civic Guard), under the bâton of Superintendent D. J. Delany, was appreciated. The guests were received by Dr. A. P. Boyd, Mr. A. A. Brunker (managing director) and Mrs. Brunker. Mr. Donald W. P. Boyd, M.A., F.C.S., and Mrs. Boyd. The directors of Messrs. Boileau & Boyd gave a similar entertainment on the last occasion the Conference visited Dublin in 1901.

Photo] [*Cleworth*

MR. BENNETT AND MR. BRUNKER AT THE GARDEN PARTY

* * * *

The outstanding excursion of the Conference week was, of course, the motor excursion to Glendalough, co. Wicklow. The weather was perfect—as it was during all the week—and the journey in charabancs was thoroughly enjoyed. At Glendalough, visitors spent the time in walking, boating and sleeping, though sleep in the sunshine was well nigh an impossibility, owing to many of the party testing the "echo." The scenery was at its best, and tea was taken at the lake-side. The return was commenced at 5 p.m., the route being through the Vale of Clara, Rathdrum, Ashford, through the Glen of the Downs, Bray, and back to St. Stephen's Green.

Photo] [*Cleworth*

A GROUP AT GLENDALOUGH

* * * *

The official photograph was not taken at the Garden Party at the Zoological Gardens, Phœnix Park, as originally intended, but in the garden of the Mansion House after luncheon on Wednesday. The operation proved somewhat lengthy, owing to the clouds and the sun not doing their bit just at the right moment, but community singing in the meanwhile helped to relax "correct" expressions, though it was not altogether beneficial for cramped legs. Those visitors on the extreme right who had thought to look distinguished while the picture was being taken were somewhat taken aback to discover that they had been cut out in the finished photograph.

* * * *

The Conference Ball was held in the Round Room, Mansion House, on Wednesday night at 8.30 p.m., and was attended by over 500. Mr. Clarke Barry's band played for dancing, and a feature of the dance programme was the inclusion of old-time valses. The Paul Jones was a favourite, as at the cabaret on the following night. Dancing continued until 2 a.m., when proceedings were

BRITISH PHARMACEUTICAL CONFERENCE 1929

brought to a close by the playing of the "Soldier's Song," followed by the singing of "Auld Lang Syne." Disappointment was felt by some of the Scottish brigade when they wanted an eightsome and could not have it. The defect was remedied, however, at the cabaret.

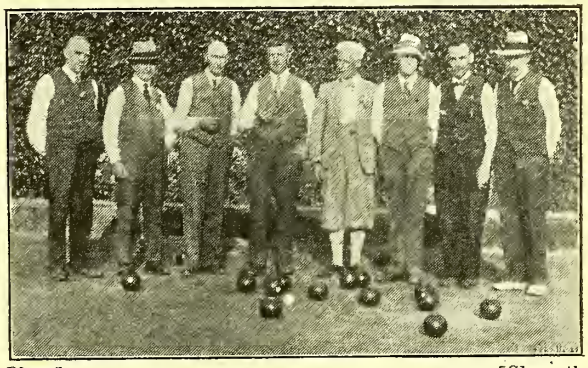
* * * *

The fancy dress ball and cabaret was held in the Round Room, Mansion House, on Thursday, and proved a huge success. There was a large attendance, and many visitors as well as local people were in fancy dress. The cabaret show was highly appreciated, the turns being given between the dances. Miss A. Fagan played several Irish airs on the harp and a minuet was danced by Miss V. Hanna and Miss M. Moylen. Other artists included Mrs. Hewson, Miss F. Sargent, Miss A. Sanders, and Messrs. J. O'Dea, D. J. Nugent, P. Kirwan, A. F. Roche, W. Rafter and W. Ready. Dancing was continued until nearly 3 a.m. and an "extra" during the evening was an Eightsome reel for the benefit of the Scottish visitors. Before supper presentations were made to members of the local committees in whose hands were the arrangements for the reception and entertainment of the visitors. Mr. R. R. Bennett called upon Mr. H. Skinner to propose a vote of thanks to the local committee for the way in which they had entertained the delegation during the week. Mr. Skinner said he

Photo] [*Cleworth*

MR. RYAN, WINNER OF THE EDMUND WHITE GOLF CUP, CONGRATULATED BY MR. FITZPATRICK.

had been so intimately connected with bringing the Conference to Dublin that he could not let the occasion pass without paying a tribute to those who had done so much to make it the success it had been. First he would like to mention the president of the Pharmaceutical Society of Ireland, Mr. F. J. Fitzpatrick, and nothing had given him greater pleasure as an old Conference visitor, one of those who had been visiting the Conferences for twenty years, than to come to Dublin and see Mr. Fitzpatrick presiding over this local affair in the City of Dublin. It was a great delight to him, because he knew the work that Mr. Fitzpatrick had done. He deserved everything that they could say of him. He next wanted to say a word about the treasurer, Sir Thomas Robinson. He thought all of them who knew Sir Thomas knew that he had done his work well. The next he wished to mention was the secretary, Mr. Victor Hanna. Mr. Hanna had done right well and had given them a right good time of it. He also called their attention to the chairman of the other committee, including the ladies' committee, who had done so exceptionally well. This was the first time that they had come to Ireland since the Pharmaceutical Society of Great Britain had taken over the Conference; and in coming over to Ireland he sincerely hoped that they had broken new ground and that it would be the first step towards uniting their people in one common feeling for pharmacy throughout their Dominions and throughout every English-speaking country. Mr. Charles A. Noble (London) seconded. The vote of thanks was adopted amidst applause. Mrs. Bennett, wife



Photo] [*Cleworth*

ENGLAND *v.* SCOTLAND

of the chairman, presented silver salvers to Mr. Fitzpatrick and Mr. Hanna and a silver cigarette box to Sir Thomas Robinson. Bouquets were presented to Mrs. Fitzpatrick, to Mrs. Nugent, and to Mrs. Hanna; and boxes of chocolate to Miss Hanna and Miss Moylen, the dancers of the minuet at the cabaret. The salver presented to Mr. Fitzpatrick bore the following inscription: "Presented to F. J. Fitzpatrick on the occasion of the British Pharmaceutical Conference to Dublin in grateful appreciation of a memorable meeting and as a token of personal affection. June 24 to 28, 1929." That presented to Mr. Hanna was also suitably inscribed. Mr. Fitzpatrick and Mr. Hanna briefly acknowledged.

* * * *

A tour on Friday morning not included in the official programme was a visit to the St. James's Gate Brewery of Arthur Guinness, Son & Co., Ltd. The party was limited to 120. On arrival at premises each visitor was presented with a souvenir guide book giving the history of the company and a description of the brewery and its products, together with a leather match case. In groups of twenty the visitors were conducted round the vast brewing plant by guides, who explained the

Photo] [*Cleworth*

MISS FLANAGAN RECEIVING THE LADIES' GOLF PRIZE

process and the plant. All were impressed by the size of the huge kieves (mash tuns), the coppers, fermenting tuns and storage vats. The tour lasted nearly two

BRITISH PHARMACEUTICAL CONFERENCE 1929

hours, and two things which struck the party most forcibly were the magnitude of the plant and its output and the extreme cleanliness everywhere apparent. At a luncheon provided by the brewery at the buffet at the end of the tour, where Messrs. Guinness's products occupied a prominent place on the tables, Mr. L. Moreton

Photo] [*Cleworth*

MERSEYSIDE VISITORS AT BRAY

Parry presided, and called on Mr. Gilleghan (chairman of the Retail Pharmacists' Union) to propose a vote of thanks, which Mr. Mallinson seconded. This was acknowledged by a representative of the firm.

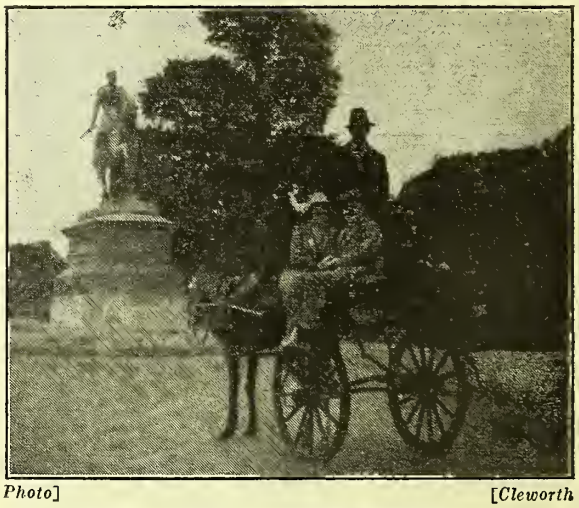
* * * *

Many said the Conference was the finest they had attended, and while this might be the thought of the moment there could be no doubt that the sports day was certainly the best since its inception in 1923. The annual golf tournament was held at Clontarf. The greens were fast, but the golf all round was good. The stroke competition for the Edmund White Cup resulted as follows :—J. Ryan (Dublin), 72; J. Gorry (co. Kildare) and T. Hindle (Sheffield), 74; W. Gray (West Essex), 75; J. Costelloe (Galway), 77; T. Hardy (Maryport), 79. Forty competed. Other results were :—Dublin Open Prize won by T. Hindle, 1 up. Men's putting won by J. Bates (Dublin) with 78. Ladies' putting won by Miss O'Flanagan (Dublin) with 91. Ladies' Competition : (1) Miss O'Flanagan (Dublin), 37½; (2) Mrs. Hughes (Dublin), 39; (3) Mrs. Downing (London), 41. An American Lawn Tennis Tournament was held at the

Photo] [*Cleworth*

Left to Right: MR. A. A. BRUNKER, MR. R. R. BENNETT, MRS. BENNETT, MR. BENNETT, JUN., MR. J. J. CRONIN, MR. J. J. KERR

grounds of the Grosvenor Club, Kenilworth Square. There was a large entry, and trophies were won by Mrs. Lester and Miss Mumford, of London. Bowls : Singles were played at Clontarf on Friday morning for the cup held over from the Cheltenham Conference, the finalists being Mr. J. Reed and Mr. Harvey P. Arthur, of Glasgow. The former won by 15 to 14. *England* v. *Scotland* at bowls for the London Challenge Cup was played in the afternoon. The teams were : England—J. Downing (Highgate), F. W. Perrett (Kentish Town), J. Reed (West Ham), W. B. Dow (Hornsey), skip. Scotland—P. M. Duff (Glasgow), T. Wilson (Burntisland), D. G. Mackenzie (Glasgow), H. P. Arthur (Glasgow), skip. The English team played superbly, and won the game on a very fast green by 24 to 11. Several games of golf were played apart from the contests mentioned. Dr. Coull, of Edinburgh, and Mr. H. Skinner had their annual contest, and the latter won for the second time in succession by 3 and 2. Prizes were distributed by Mr. F. J. Fitzpatrick, president of the Pharmaceutical Society of Ireland. Mr. Downing paid a compliment to the secretary of the Sports Committee, Mr. Roche, who had worked hard to make the sports a success, and the Clontarf Club. Mr. Skinner moved a vote of thanks to Mr. Fitzpatrick and the Irish Society.



Photo] [*Cleworth*

SOME CONFERENCE VISITORS IN PHŒNIX PARK

On Friday evening a musical "At Home" was held at the Shelbourne Hotel, the Conference headquarters. This was well attended, though many of the male visitors were absent owing to masonic duties having called them elsewhere. Musical items, dances, recitations and sketches were given, and the evening passed off very enjoyably, though another "late" night was not part of the official programme, in view of the start of the week-end excursion to Killarney on the following day. At the conclusion of the evening Mrs. V. E. Hanna, who organised the "At Home," was presented with a bouquet of roses by Mr. F. J. Fitzpatrick.

* * * *

Much sympathy was felt for Mr. Victor Hanna, who had the misfortune to slip up on the step at the Mansion House on Friday morning and injure his shoulder and arm. It was feared at first that the injuries were serious, but the visitors were immensely relieved to learn that the first wild rumours of concussion and broken shoulder-blades were untrue. He was immediately conveyed home by Sir Thomas Robinson in his car and Sir Thomas promptly brought Mr. Gunn, a leading Dublin surgeon, to attend him. "To think that this should happen at the very end; but wasn't it lucky that the Conference was practically over," was the general comment. A Dublin correspondent, writing on July 2, states that Mr. Hanna is progressing satisfactorily. *x*-ray examination has revealed no broken bones.

Trade Notes

NESTOL, for curling babies' hair, is advertised in this issue by C. Nestlé & Co., Ltd., 48 South Molton Street, London, W.1.

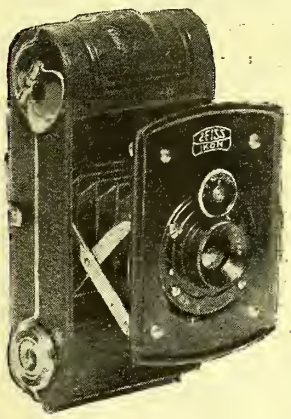
DATED FOODS.—George King & Co., Ltd., Albion Food Mills, Sycamore Street, Old Street, London, E.C.1, remind chemists that unsold stock of Lactrex, Wheatrex and Oatrex foods dated June 30 should be returned for replacement. The company pays carriage one way.

CHEMISTS' SHOPFITTINGS.—J. C. King, Ltd., 42-60 Goswell Road, London, E.C.1, advertise this week their Salesmaker solid oak or mahogany frame glass showcase, and Goswell fittings. The new illustrated list, No. 1,021, and particulars of the deferred payment scheme will be sent post free on request.

VEET DISCOUNT OFFER.—The Dae Health Laboratories, Ltd., 68 Bolsover Street, London, W.1, advertise a special discount offer open until August 15. Orders for Veet placed prior to this date receive an extra discount. Readers should turn to the advertisement appearing in this issue for further particulars.

HARLENE SHAMPOO.—Edwards Harlene, Ltd., announce that an extensive advertising campaign is being undertaken for their new liquid shampoo. Chemists should turn to the advertisement pages of this issue for particulars and write to Edwards Harlene, Ltd., 20-26 Lamb's Conduit Street, London, W.C.1, for terms.

THE BOBETTE MODEL I, a Zeiss Ikon product (Garner & Peeling, Ltd., Polebrook House, Golden Square, London, W.1), is intended to meet the demand for an extremely small, compact camera, at a moderate price. Folded it measures two by four inches, and is one inch in thickness; as will be seen from the accompanying illustration, it has a "pull-out" front which is held in position by rigid struts. The Bobette Model I is supplied with an *f*/8, or *f*/4.5 lens, and a gear-controlled speeded Cronos shutter, with iris diaphragm and wire release, and takes pictures measuring 1¼ in. by ⅞ in.—standard cinematograph size—on roll film supplied in spools for twelve and twenty-four exposures.



GOODALL, BACKHOUSE & Co., manufacturing chemists, Leeds, draw the attention of chemists to the fact that they are, and have been for several years, the wholesale selling agents for Iglodine and Iglodine specialties in the counties of Yorkshire, Lancashire, Lincolnshire and Cheshire. Chemists generally are still unaware of this agency, and many delays in the execution of the orders occur.

VITAGESTIVE TEA, which is being placed on the market by Charles Wilson & Co. (London), Ltd., Lisson Grove, London, N.W.1, is stated to contain 3 per cent. of theine and 12.7 per cent. of tannin, and it is claimed that the proportion of these two constituents approximates the best combination for the digestion. While the proportion of tannin is low, the tea is of fine quality and full flavour.

A PORTABLE PRINTING PRESS.—"Sloganpress" Co., 83 Farringdon Street, London, E.C.4, have brought to our notice a printing press which would appear to be a distinctly useful piece of apparatus in most wholesale and many retail pharmaceutical businesses, particularly for such matters as overprinting on invoices, labels, catalogues, and so forth. The overall dimensions of the machine are 8 in. by 5½ in. by 7 in., and it weighs approximately 14 lb. The printing surface is 2⅜ in. by 1⅜ in., and ordinary printers' type is used. For printing all that is necessary is to pull down a small handle.

MASQUE ROUGE FACE POWDER.—Parfums Marcel Guerlain, Ltd., 252-60 Regent Street, London, W.1, ask us to call the attention of subscribers to the fact that the special offer which the company recently made in the advertisement pages of the *C. & D.* should have read: A large tube of creme de beauté free to each customer purchasing a 2s. 6d. box of Masque Rouge face powder.

NUSALIN.—Savory & Moore and John Bell & Croyden, 143 New Bond Street and 50-52 Wigmore Street, London, W.1, are making a special introductory offer in connection with Savory & Moore's Mayfair "A" Brand Nusalin, which, as its name implies, is an effervescent saline with some unusual features. In the first place the style of packing is distinctive. The bottle, as will be seen from the illustration, is oval-shaped with a screw top, and it is enclosed in a neat and attractive carton. The predominant notes in the printing are gold, white and green. As to the saline, it is a preparation worthy of these two well-known houses, and incidentally free of sugar. Particulars as to sizes and prices are given in the advertisement pages.

BURSTPROOF HOT-WATER BOTTLE.—P. B. Cow & Co., Ltd., 46-47 Cheapside, London, E.C.2, invite orders for this new bottle which is made by a patent process with sewn seams. Each bottle is tested to a strain of two-and-a-half tons which the makers claim will entirely obviate any chance of a leak or burst. Showcards and advertising leaflets are supplied if desired.

PEARS' SOAP COMPETITION.—The conditions of this photographic scheme, run by A. & F. Pears, Ltd., 71 New Oxford Street, W.C.1, are of interest. Primarily the scheme is a competition to find the most charming woman in the British Isles, and snapshots must be sent accompanied by an entry form. Nothing else is needed, no wrappers, coupons or stamps, and prizes to the total value of £2,600 are offered. The enterprising chemist should be able to sell films and other photographic material, and in addition to this there is £1,000 in sixty-four cash prizes to be distributed among the trade to those responsible for developing and printing the snapshots, and to those whose names are mentioned on the largest number of entry forms returned. No qualifying order for the soap is necessary. All that need be done is to write to the promoters asking for a supply of entry forms and window material.

LES PARFUMS GODET.—Les Parfums Godet, Ltd., 153-5 Regent Street, London, W.1, have recently called our attention to several of their leading lines of toilet and perfumery requisites. Among those which are particularly attractive is the Forget-me-not series of preparations, including perfume, soap, lotion, brilliantine, compact and talcum powder. Daintily packed in a style appropriate to the flower after which they are named, these preparations should appeal to the clientele which is associated with high-class pharmacy. The perfume, which is pleasing and lasting, is stated to be compounded from natural floral essences. The illustration shows one of the miniature showcards which are supplied to focus attention on the perfume. It depicts a bottle of the last-named on a background representing a forget-me-not corolla.

Personalities

MR. H. HINDE, pharmacist to Rhodesia Railways, is arriving in this country on July 15 for a visit of several weeks.

MR. HAROLD MONK, F.I.C., a member of the Liverpool city analyst's staff, has been appointed public analyst for Salford.

AT a recent installation meeting of the Amherst Lodge, London, Bro. J. E. Corringham, chemist and druggist, was installed as Junior Warden.

THE silver wedding of Mr. and Mrs. E. J. Hughes, Melksham, recorded on this page, is of further interest from the circumstance that on June 29 their only daughter qualified as a chemist and druggist, almost on the twenty-fifth anniversary of her father's starting in business.

CERTIFICATES OF NATURALISATION have been granted to E. E. L. Burnier, medical practitioner, 6 Crawford Gardens, Margate; H. Gelpke, wholesale merchant in chemical products, 17 Harcourt Road, Wallington, Surrey; S. G. K. Kastelianski (known as S. G. K. Kastelian), physician and surgeon, 123 Manor Road, Stoke Newington, London.

A LIMITED liability company has been formed under the style of A. Giffin & Co., Ltd., whose managing director, Mr. A. Giffin, has been for the last thirty years with the well-known firm of Mincing Lane merchants, Richard Quincey & Son, who, we understand, are closing down in the near future, consequent upon the recent death of the sole partner, Mr. E. de Q. Quincey.

MISS BARBARA E. WHITILE, third daughter of Mr. James Whittle, chemist and druggist, Morpeth (a past-chairman of the Newcastle and North of England Branch of the Pharmaceutical Society), has graduated at the Armstrong College, Newcastle, as B.Sc. in pure science, with second-class honours in zoology. Mr. Whittle's eldest and second daughters are chemists and druggists.

Births

Notices for insertion in this column must be properly authenticated.

KIRKMAN.—At Stretford, Manchester, on June 20, the wife of Douglas Kirkman (W. E. Kirkman, Ltd., New Milton), of a son.

RUSSELL.—At 1 Mayville Street, Stevenston, on June 13, the wife of John Russell, chemist and druggist, of a son.

Marriages

CRITCHLEY—RAFFELL.—On July 1, Francis George Critchley, chemist and druggist, eldest son of Mr. C. A. Critchley, J.P., Ph.C., Adelaide Terrace, Blackburn, to Edith F. Raffell, Blyth, Northumberland.

HARWOOD—ATKINSON.—At St. Martin's-in-the-Fields, London, W.C.2, on June 27, by the Rev. J. Griffiths, Percy Hume Harwood, Greystones, co. Wicklow, to Annie Margaret Atkinson, only daughter of Mr. and Mrs. A. Proctor Atkinson, 27 Queensborough Terrace, Porchester Gate, W.2.

MIDDLETON—ASHCROFT.—At Toxteth Congregational Church, Liverpool, on June 20, William Malcolm Middleton, L.D.S., Wallasey, to Edith Lillian, only daughter of Mr. A. W. Ashcroft, chemist and druggist, Liverpool.

Silver Weddings

HUGHES—EDWARDS.—At Dewsall Court, Herefordshire, on June 23, 1904, Ernest James Hughes, chemist and druggist, to Louise Edwards.

TILDESLEY—COLLINS.—At the Wesleyan Church, Eastwood, Rotherham, on June 22, 1904, Robert William Tildesley, chemist and optician, to Clara Collins, 7 Elmwood Gardens, Acton, London, W.3.

Deaths

ANSLOW.—At Grosvenor Sanatorium, Kent, on June 17, Mr. William Ewart Anslow, chemist and druggist, aged thirty-two.

BATE.—On June 15, Mr. Arthur Macaulay Bate, chemist and druggist, manager of Martyn's Stores, Ltd., chemists, Leicester Square, Wolverhampton, for sixteen years, aged seventy-four.

BOWER.—At 10 The Parade, Grove Green Road, Leytonstone, on July 3, Mr. John Bower, chemist and druggist, aged forty.

COPE.—At Dursley, on June 14, Mr. Arthur George Cope, Ph.C., aged forty-eight.

FLETCHER.—At Windsmill, Enfield, on June 30, after a long and painful illness, Annie, the wife of Mr. Frederick W. Fletcher, Ph.C., F.C.S., aged seventy-six.

MASTERSON.—On June 18, Clara Elizabeth, the beloved wife of Mr. F. H. Masterson, drug-store proprietor, Sherburn-in-Elmet.

NESS.—At The Cottage, Tarbolton, on June 22, suddenly, Mr. Thomas Ness, chemist and druggist. Mr. Ness qualified in 1884. He carried on business for several years at Dalmellington before settling in Tarbolton. Mr. Ness was a member of the Ayrshire Insurance Committee, and was well known in freemasonry.

WHITE.—At 86 Shakespeare Road, Hanwell, London, W.7, on June 29, Mr. Paul Thomas White, F.C.S., senior director of Alfred White & Sons, Ltd., manufacturing chemists, 28-31 Allen Street, London, E.C.1, aged seventy-nine.

WILLIAMS.—On June 11, suddenly, Mr. William John Williams, chemist and druggist, Llanbradach. Mr. Williams qualified in 1898.

Trade Mark Applications

The figures in parentheses refer to the classes in which the marks are grouped. A list of classes and particulars as to registration are given in "The Chemist and Druggist Diary," 1929, p. 333.

(*From "The Trade Marks Journal," June 5, 1929.*)

"PLANEDRIN"; for medicinal chemicals (3). By May & Baker, Ltd., Church Road, Battersea, S.W.11. 501,775. (Associated.)

"SOLSPRIN" and "PLUSPIRIN"; for medicinal chemicals (3). By G. A. Dunbar, 75 Seymour Street, Marble Arch, London, W.2. 501,978/979.

"NECTIN"; for dyes and bleaching substances for the hair (48). By J. Bergmann & Co. Radstrasse 22, Laupheim, Wurttemberg, Germany. 500,099.

"GO NAP"; for shaving cream (48). By Go Nap Shaving Cream Co., 49 Geoffrey Street, Preston. 500,632.

"CYNOSIA", for soap (48). By T. C. Redfern, 26 Jackson Street, Hyde, Cheshire. 501,604.

"DENOL"; for dentifrices and powders for securing dental plates (48). By F. W. Renwick, 9 Highfield Road, Alum Rock, Birmingham. 501,781.

"BOIS DORMANT"; for perfumery, etc. (48). By Parfumerie Houbigant Société Anonyme, 19 Rue du Faubourg Saint Honoré, Paris. 502,322.

(*From "The Trade Marks Journal," June 12, 1929.*)

"SERVAL" on design including cross on circle and lady carrying basket; for chemicals (1). By Beekers, Ltd., 105 Upper Thames Street, London, E.C.4. 484,216. (Associated.)

"PALESIT"; for chemicals (1). By P. Lechler, Kronenstrasse 50, Stuttgart, Germany. 499,998. (Associated.)

Information Department

INFORMATION WANTED

Postal or telephone information with respect to makers or first-hand suppliers of the undermentioned articles will be appreciated.

W/170 Aeolan Prep.
T/27 "Dixie" hygienic towel
M/027 "Evaginine"
H/47 "Khus-Khus Grass" for moths
S/106 Harrison's kidney and bladder pills
B/246 Gipsy oil
E/256 Laxofood capsules
A/17 Polysan (Becka Brunn Clinic
B/186 Protectol (for sunburn)
W/246 Tonophosphan (London source)

Observations and Reflections

By Xrayser III

In the First Place

I, along, I am sure, with all your other readers, offer you the heartiest congratulations upon the magnificent special issue of the *C. & D.* just to hand; and in the second place you deserve sincerest thanks for the enterprise and ability which have provided so rich a store of scholarly knowledge so finely illustrated to illuminate the history of medicine and pharmacy. Professor Singer's article on Anglo-Norman medicine and its connection with the School of Salernum, where Duke Robert of Normandy (eldest son of our William I) resided for a time, is especially valuable as an introduction to the study of European medicine in general, because it was at Salernum that systematic teaching of medicine and rules for its practitioners were first undertaken and formulated. The monograph on "La Farmacia del Papa," by Dr. Carbonelli, is particularly enjoyable, with its delightful photographs of the drug pots. To my mind the Italian faience of this period—the early seventeenth century—is most excellent, notwithstanding that some connoisseurs may say that the decoration is an exhibition of the art of the Renaissance "running to seed." Its fascination for the collector is not to be resisted. Of course, the extreme austerity seen in the ceramic productions of Lambeth of that century are a strong contrast—as they may well be, seeing that our factories were in the throes of infancy. But at no time has our pharmaceutical ceramic ware taken on art forms and decoration comparable with the Italian majolica. Space does not permit me to do more than mention your most valuable account of Weights and Measures, which is an acquisition to the library of every archæologist. It is a little treatise which should be separately bound for the use of all students of archæological matters.

A Text-Book of Materia Medica

of considerable interest could be compiled around the Thoresby prescription which Mr. Holmes has commented upon in such an illuminating fashion. An essay at least would be required to bring into modern terms the great number of remedies Ralph Thoresby was ordered to negotiate. There is one item to which Mr. Holmes has put a question mark, thereby intimating that even his extensive knowledge had suffered a lapse. It was really a lapse of memory, because the herba paralyseos is only the palsy-wort, a drug pretty well known and in considerable repute in the seventeenth century. It found a place in the first London Pharmacopœia under its usual name of *Primula veris*—the cowslip—together with two usual synonyms, namely, the one in question and that of *Verbasculum odoratum*. Its recognition as an official drug continued until the time of the Pharmacopœia Londinensis of 1746. The syrupus paralyseos was a preparation in extensive use on the Continent, and accordingly formulas for it occur in several foreign dispensatories of that period. The drug was a general constituent of the different varieties of aqua paralytica, a medicine considered to be of great value. Cowslip conserve and cowslip water were esteemed by our forbears as much as cowslip wine by us. The medicinal properties and the names of the oxlip and cowslip are dealt with by Gerard, in his Herbal, in so intimate a manner that in this instance we know we are obtaining from him real first-hand information which helps us to keep him on his pedestal as a worthy English herbarist. To him I should like to refer those who desire more information concerning this rather out-of-the-way drug but delightful, ever-enchanting flower of our English spring.

Special Issues

of the *C. & D.* come to remind us of many things, including the lapse of time, but they never fail to remind me particularly of the constant watchfulness exercised on behalf of chemists by those responsible for the production of the paper. By the provision of wonderfully illustrated articles, you interest us in matters of which a knowledge benefits us in a variety of ways, and there is usually practical information of undoubted value in each special issue. On this occasion I find a most useful addition to my stock of knowledge in Mr. Herbert Skinner's notes on the preparation of solid spirituous preparations. More than one idea has suggested itself to me after carefully reading these notes, and reperusal of them makes me feel confident that money can be made by application of the principle so lucidly explained in Mr. Skinner's article. Never was there a truer remark than the concluding sentence of the article, which states that the mind of the true pharmacist only needs a slight suggestion to become fertile in ideas; but I would like to add that he also is a true pharmacist, and one of the highest type, who can give us the suggestions, slight or otherwise, that excite our minds to the point of generating ideas such as can be turned to business-increasing account.

Conference Attendances

tend to increase in number, and I shall expect to learn that the attendance at Dublin this year has been much greater than the 147 recorded as being present at the meeting held there in 1878 (*C. & D.*, June 29, p. 784). But it seems to me most improbable that more "true" pharmacists will have been supporting Mr. Bennett there than supported Mr. Schacht, and the actual probability is that there will prove to have been fewer. More chemists and druggists attend the Society's Conference these days for the sake of meeting old friends and enjoying a holiday in a fresh place than because of any particular interest they take in the subjects of papers read. But this is not to say that there is anything disadvantageous about such a condition of affairs. Chemists and druggists have learned to pull together much more since the attendances at the yearly conferences began to expand appreciably, and all of us are the better for this, whether we are able to attend the meetings regularly or not. I make free to assert that the chemists and druggists of this country know one another immeasurably better to-day than they did before the Pharmaceutical Society took over the responsibility of the affairs of the B.P.C., and that there is much less risk of misunderstanding between the chief chemists in different and widely separated districts than was possible fifteen or twenty years ago. As the well-known song may be parodied, "The more we get together, the better friends are we," and as time passes our friends become others' friends, and so the good work of guarding against misunderstanding goes on.

Is It Correct

that chemists waste time and opportunities by making window displays designed to educate the public to a clearer idea of what pharmacy is? One of your recent correspondents seems to think so (*C. & D.*, June 8, p. 703), presumably because he feels that people know they must visit a pharmacy in order to get their prescriptions dispensed. But it must not be overlooked that there are pharmacies and pharmacies, some belonging to independent chemists, while others belong to capitalist concerns. Though the latter may be under qualified managership, the profits they make do not, as a rule, go to benefit pharmacists, and it seems to me wise procedure to make up our minds to do everything humanly possible to persuade the British public that the independent chemist is more to be relied upon generally. I am referring more particularly to the chemist who not only owns the business at the place where he practises, but also gives it his personal and undivided attention, for to such will be due the salvation of pharmacy as a profession, if salvation is achieved in the days to come. On the trading side we have to battle with the multiple-shop concerns, the department stores, and the co-operative societies, and may hold our own even with them. But on the professional side there ought to be no question of our superiority, because it is only the individual proprietor-pharmacist who can give the personal attention that the public likes and is entitled to receive. We must, however, convince our customers that they can do better by coming to us than to concerns under non-proprietor management, and that seems to provide a reason for advertising what pharmacy is and how pharmacists differ from other owners of shops where chemists' goods are sold.

Editorial Articles

The Conference Papers

THE science section of the British Pharmaceutical Conference has this year received twenty science papers or, counting those on the differentiation of phenols as one, eighteen papers. Although not impressing the average reader by reason of any startlingly novel feature, the papers as a whole are of a useful type, and one or two of them rise above this level. By way of introduction to the abstracts of the papers which appear in our report of the Conference proceedings on other pages of this issue, we have drawn up brief notes on their subject-matter. The variable composition of cinchona febrifuge is elucidated in an informative monograph by Dr. David Hooper, entitled *On the Standardisation of Cinchona Febrifuge.* Dr. Hooper states that through purely utilitarian causes the composition of the mixed alkaloids has varied considerably. He appears to favour the suggestion of Lieutenant-Colonel Gage that by cultivation a fairly constant average of alkaloidal constituents could be secured. Mr. Thomas J. Smith has contributed two papers on suppositories, one entitled *The Densities of Substances used in Suppositories,* setting forth data enabling the dispenser to allow for varying densities of the ingredients employed, and the other *The Making of Hollow Suppositories,* giving details of a modification of Morgan's method. Messrs. W. J. Beardsley and F. J. Bolton have investigated *The Stability of Syrupus, B.P.,* with a view to determining the difference in keeping properties between small batches and those made on a manufacturing scale. The conditions necessary for minimising the formation of invert sugar are indicated. Trials of all the known methods have been made by Mr. G. J. W. Ferrey in the preparation of his *Notes on the Determination of Nitrates in Bismuth Carbonate.* The conclusion is that the official method of the Board of Agriculture and Fisheries, involving the reduction of nitrate to ammonia by reduced iron and dilute sulphuric acid, gives accurate and consistent results. *The Petroleum Spirit Test for Purity of Castor Oil* has been the subject of a series of experiments by Messrs. T. Tusting Cocking and Sydney K. Crews. The authors have demonstrated that this solubility test will not function unless the petroleum spirit contains some aromatic hydrocarbon. The limits of the test are considered to be too wide to justify its retention in the Pharmacopœia. *Some Notes on our Native Materia Medica* is the title of a paper by Mr. M. V. Sargent on several Irish plants and other raw materials which are used (or are usable) in medicine. Mr. Norman Evers has chosen *Some Observations on the Antimony Trichloride Colour Test for Vitamin A* as a topic. This paper adds to the general knowledge of the subject, and the research work has been carried out with the author's customary thoroughness. It is considered that the antimony trichloride should be recrystallised, and that the solution should not be more than a month old. The

effect of the quantity of oil taken for the test was investigated, and the addition of a neutral oil, when necessary, is recommended. *The Volumetric Determination of Phosphoric Acid* has been investigated by Mr. Wilfred Smith, who has evolved a method with which, by using two indicators, the direct titration of the acid may be carried out. *A Note on Extract of Gentian* is the title of a paper by Mr. H Davis, who has examined five samples in order to arrive at an understanding as to what is meant by the official expression "a soft extract." Mr. Davis is of opinion that a moisture limit of 20 per cent. should be laid down, and gives a process for determining the moisture in the extract. Mr. S. Gordon Liversedge has made a study of *The Gravimetric Electrodeposition of Metals and its Application to Pharmaceutical Chemicals.* The cheapening of electricity and improved methods in this form of analysis are expected to bring about more general use of the process. The neglect of electrometric methods by the British Pharmacopœia is noted. Mr. Alan H. Ware has submitted four papers on tests for phenols. Under the title *The Use of Aldehydes and Dihydrox-acetone in the Detection and Differentiation of Phenols* there are three papers. The first of these deals with the *Colour Reactions given in Sulphuric Acid Solution,* and tabulated results for methods using dihydroxyacetone, tartaric acid and formaldehyde are discussed. The results described in the second paper, *Precipitation and Staining Tests involving the Use of Hydrochloric Acid,* are grouped under three heads: (1) The use of formaldehyde as a precipitant of phenols; (2) the use of dihydroxyacetone for the same purpose; and (3) the deal-shaving and other staining tests for phenols. Work on the third paper concerns *The Detection of Cresol in Carbolic Acid by Means of Vanillin.* The fourth paper is entitled *Some Distinctive Tests for Phenols involving the Use of Hydrogen Peroxide,* and considers the subject from two standpoints. Mr. C. M. Caines has followed up his work on belladonna by a paper on *The Assay of Hyoscyamus Leaves and Extract of Hyoscyamus, B.P.* The work was undertaken with a view to ascertaining whether methods previously enumerated were applicable to hyoscyamus: a new process is suggested. Mr. Caines also contributes a *Note on the Keeping Properties of Unguentum Belladonnæ,* the basis of which is his examination of four authenticated samples. Mr. Caines finds that the ointment does not deteriorate in alkaloidal strength within a reasonable period. *The Effect of Certain Gases on the Oxidation of Ether* forms the topic of the paper by Messrs. F. C. Hymas and G. Middleton. The gases experimented with were air, oxygen, carbon dioxide, nitrous oxide and mixtures of these in equal parts. Recommendations are made to reduce the extent of the oxidation as far as possible. Mr. F. C. Hymas publishes observations on three chemical methods of testing the emission of ultra-violet lamps in his paper on *Photochemical Methods of Testing Sources of Ultra-Violet Radiation.* Effects of duration of exposure, temperature and the age of the lamp have been recorded; and it is shown that the recognised tests yield different records of the apparent rate of decrease of emission because each chemical responds to a different region of the spectrum. *A Note on the Potency of Digitalis Lanata* is the result of work in the Pharmacological Laboratories by Mr. Frank Wokes. It is concluded after physiological experiments on cats and on frogs that the sample of *Digitalis Lanata* examined is probably from three and a half to four times more potent than standardised *D. purpurea.* As indicated in our Special Issue of June 29, we reserved the full text of the chairman's address for this number, it will be found to give a concise and valuable summary of progress in pharmacology. These contributions to current scientific thought should prove of value to chemists in wholesale, retail and academic spheres.

If the Cap Fits

In its issue of April 27, "The British Medical Journal" made a pointed reference to "some highly objectionable advertisements of a proprietary brand of yeast" appearing in American and Canadian journals which circulate also in this country. Testimonials purporting to be signed by medical men in Europe and in the United States were a feature of the advertisements. Our contemporary could scarcely believe that the doctors mentioned by the manufacturers had sanctioned this use of their names, and hoped to have an opportunity of publishing their disclaimer. After four week's silence there appeared in the "B.M.J.'s" correspondence section a significant letter from Dr. Donald Armour, a West End practitioner, to the effect that he had been offered the sum of £150 for a testimonial to an advertised brand of yeast, but that he showed his interviewer the door with the remark that there were things in life he valued more than £150. On June 8 the same journal published a similar communication from a Montreal doctor. The matter has been taken a stage further by the "Journal of the American Medical Association" of June 15, which not only designates the preparation and quotes a substantial part of Dr. Armour's letter, but also adds the names of four British, five French, six German or Austrian and three American physicians or dietetic experts who are alleged to have eulogised this brand of yeast. We do not propose to intervene in this interesting inquiry, which, so far as this country is concerned, may be regarded as potentially the affair of the General Medical Council; but the names of at least four of the seven English-speaking experts are quite familiar to our readers.

Retail Pharmacists' Union

Meetings of the Executives of the Retail Pharmacists' Union and Chemists' Defence Association were held at 4/5 Queen Square, London, W.C.1, on June 18, Mr. H. Gilleghan in the chair.

Death

The Chairman referred in feeling terms to the loss which the Executive had sustained through the death of Mr. Jackson (Sheffield), whose sound business common sense and advice would be greatly missed in their deliberations. A resolution expressing sympathy with Mrs. Jackson and her son, and appreciation of Mr. Jackson's services, was directed to be recorded in the minutes.

Pharmacy Week

The secretary reported that there had been delay in getting out circulars to chemists owing to difficulties with the postal authorities; these had been overcome.

"Daily Mail" Advertisements

The attention of the Executive was drawn to the "Daily Mail" posters which are sent out to chemists for exhibition on chemists' windows, etc. Protests were received that chemists could not possibly exhibit the posters so long as it was the custom to include in such advertisements and on the posters the names of chemists' competitors. The Executive were of opinion that in such a connection no individual firms should be mentioned, as the poster was rendered useless for the private chemist by references to all the multiple firms.

C.D.A. Matters

The secretary reported that of the ten cases outstanding since the last meeting one might be considered closed. Four new cases had arisen during the month. One claim for burns caused by glycerinum acidi carbolici supplied had been settled for 30s., and the remaining three cases were left in the hands of the secretary.

The secretary reported that a member had been defended in regard to four summonses for failing to keep a D.D. Act register. Two of the summonses had been dismissed, and a fine of £10 had been imposed in regard to each of the other two summonses, with £1 19s. costs. Two cases had been defended under the Food and Drugs Act. In one case the member had been fined £10, and £10 costs; in the other case the member had been fined £1, and 10s. 6d. for analyst's fee on each summons.

British Pharmaceutical Conference

THE PROCEEDINGS

FROM all points of view—attendance, scientific, business and social—this year's meeting of the British Pharmaceutical Conference in Dublin was an outstanding success. The opening events were dealt with in the *C. & D.* Annual Special Issue, but the real work commenced after the chairman's address (p. 3) of this issue) on the Tuesday morning. Deliberations on the science papers and meetings of the delegates of the Pharmaceutical Society of Great Britain occupied the greater part of that day and Wednesday. Following Mr. Bennett's "Changing Foundations of Materia Medica" most of the ladies left for an excursion to the Botanical Gardens, and, after a short interval, the science session opened with a good attendance.

Science Section—Tuesday Morning

The first paper presented was :—

On the Standardisation of Cinchona Febrifuge

By DAVID HOOPER

[ABSTRACT]

FEBRIFUGE, or quinetum, is a name given to a mixture of the total alkaloids obtained from the bark of *Cinchona succirubra*, a tree cultivated in the Government plantations in India and by the Dutch Government in Java. The total alkaloids are usually extracted from the powdered bark by diluted acid and the resulting solution treated with an excess of soda; the precipitate is then pressed, dried and powdered. The composition of "red bark," the commercial name of this species of *Cinchona*, is not rich enough in quinine for the manufacture of its crystallisable salts, and hence is made to supply a mixture of alkaloids of acknowledged use in the treatment of malarial fever. Febrifuge has now been known for over fifty years, but it has always been regarded as a by-product of the quinine factory, and its production is a convenient method of using up the red bark from trees early planted in the Government estates.

The average centesimal composition of red stem bark grown in the Madras Government Cinchona Plantations from 1884 to 1897 was : Quinine, 17.6; cinchonidine, 43.4; quinidine, traces; cinchonine, 29.4; amorphous alkaloids, 9.6. From such material it was possible to obtain a powdered preparation of alkaloids consisting, in round figures, of quinine, 10; cinchonidine, 40; quinidine, traces; cinchonine, 32; amorphous alkaloids, 10; moisture, ash and matters insoluble in acid 8 per cent. But the composition of different batches of febrifuge was never stable, consequent on its being made from branch, stem or root bark taken from trees of various ages. The above figures, however, do not differ widely from the average composition of quinetum manufactured in Java and analysed by Dr. de Vrij, the Dutch quinologist, and Dr. Oudemans, but, here again, individual analyses differ considerably. The main feature of the alkaloidal composition of red bark is the preponderance of cinchonidine and cinchonine. The standard pharmacopœial content of red bark is "5 to 6 per cent. of alkaloids of which not less than one-half should consist of quinine and cinchonidine." As long as febrifuge is being made from this source, a safe indication of its composition might be expressed in the statement that it is "a mixture of the natural alkaloids of the bark of which more than one-half consists of cinchonidine and cinchonine."

Dr. de Vrij was the first to advocate the manufacture of quinetum in the Java plantations, but it was said to be made at a loss and its manufacture soon became neglected. The Dutch objective, under Moens and van Gorkom, was to produce an abundance of quinine, the therapeutic value of which is undoubted, the manufacture of which is simple, and the purity of which could be readily estimated. The same policy was adopted in the cinchona plantations in British India, where the cultivation of quinine bark trees was gradually extended at the expense of the red bark trees. As a consequence, about the year 1903 succirubra bark become scarce in the Government factories in India, and febrifuge began to be made from the residual alkaloids of *C. Ledgeriana*, *C. officinalis*, and the hybrids of these two species with *C. succirubra*. While in some analyses the percentage of quinine is maintained, there is, on the whole, a diminution in the amount of cinchonidine and cinchonine. Another peculiarity is the decided increase in quinidine, a dextro-rotatory alkaloid usually associated with root barks. But the most noticeable change is the preponderance of amorphous alkaloids, a result which one would naturally expect in the residual liquors of sulphate of quinine obtained from Ledger bark. From a medical point of view the various alkaloids of cinchona bark, taken separately, and each prepared in a chemically pure state, have been found to be effective remedial agents in fever; quinidine, for instance, being equal to quinine. With regard to amorphous alkaloids, their presence in febrifuge is not an advantage from a pharmaceutical standpoint, since they tend to solidify or "cake" and so could only be made into solutions or sold in tablet form. Notwithstanding their unsuitable consistence the amorphous, like the crystallisable alkaloids, have been found to be a valuable remedy in fever, and a moderate quantity in the mixed alkaloids is not regarded as objectionable.

The only cinchona alkaloid in the British Pharmacopœia is the crystallised sulphate of quinine, which must not contain "more than 5 per cent. of sulphate of cinchonidine." Compared with a salt of such purity one hesitates to render official a mixture of five alkaloids the proportion of which depends upon the exigencies of the cinchona plantations and the quinine factories. Lt.-Col. Gage recognises the use of febrifuge as a supplement to quinine, and suggests the wise policy of "reverting to the cultivation of *C. succirubra* and the extraction of its total alkaloids to form again the original cinchona febrifuge. By bark mixture on a sufficient scale, and, in time, by selection of trees, a reasonably steady average of alkaloidal constituents could be assured." If this policy is pursued and when a preparation containing a suitable and fixed proportion of alkaloids is on the market, it will be possible to acknowledge it as an official medicine.

DISCUSSION

The CHAIRMAN said they were all obliged to Dr. Hooper for the paper. Mr. Bernard Howard had contributed a paper on cinchona febrifuge five or six years ago and it was interesting to have another paper from so eminent an authority. He thought Dr. Hooper had done much to clear up the confusion which exists.

Mr. D. LLOYD HOWARD referred to the difficulty of standardisation which might be overcome if *Cinchona succirubra* were specially grown, while a uniform standard would be of benefit for workers in tropical diseases.

Dr. BRYANT inquired as to the differences in the alkaloids of the stem and branch bark.

Dr. HOOPER said there is a difference. The branch bark contains more amorphous alkaloid. Cinchonine and cinchonidine were abundant in the stem and in the root bark quinidine.

BRITISH PHARMACEUTICAL CONFERENCE 1929

Mr. L. G. WOOD asked as to the effect of climatic conditions.

Dr. HOOPER replied that *C. Ledgeriana* grew best at an altitude of 6,000 to 7,000 feet, *C. succirubra* slightly lower, and *C. calisaya* at a still lower level.

Mr. WALMSLEY referred to some alleged cinchona febrifuge tablets he had examined and found to be 80 per cent. inorganic matter—mostly fuller's earth.

Mr. R. E. JACKSON inquired whether the author does not regard it advisable to limit the quinidine in standardising the preparation. The drug is used to a large extent in India, and he thought its inclusion in the next Pharmacopœia was a matter for consideration.

Dr. HOOPER said the matter might well be considered.

The next paper taken at this session was :—

The Density of Substances Commonly Used in Suppositories

By THOMAS J. SMITH

[ABSTRACT]

IN a series of researches conducted by the late Edmund White and J. O. Braithwaite, among other results it was found that a 15-gr. suppository mould (with six holes), filled three times in succession with cocoa butter, gave a mean variation of about ¼ gr. in the capacity of each hole. The filling of the mould was done with extreme care, the thinnest possible film of soft soap being used as a lubricant. As I contemplated using a 3.5-gm. pessary mould for the determination of the densities, I tried the effect a proportionate variation of 1 gr. would have, particularly in the case of substances of high density, and found that an error of this magnitude would give hopelessly misleading results. In the case of a 29-per-cent. mass of bismuth carbonate made with the cocoa butter, in a mould of 3.5 gm. capacity, the weight of the finished pessary was 4.160 gm., which gave a density of 4.8. If the weight of the pessary was increased by this proportionate error of 1 gr. (0.06 gm.) the density became 6.8. With a view to minimising as far as possible similar errors due to manipulation a number of preliminary experiments were undertaken with a view to determining suitable methods which would give fairly reliable results. As a result of these experiments the following procedure was adopted in each case :—

(1) A definite percentage mass of the substance was used in preference to taking a fixed weight of substance, adding a portion of the melted cocoa butter and pouring into the mould, further portions being used to rinse out the dish and fill up the mould. With slight variations in weight of final product, which were unavoidable, the content of substance varied to some extent proportionately in the mass of definite percentage, whereas it was fixed and the error had the maximum effect in the alternative method.

(2) To avoid loss in transferring the melted cocoa butter on to the slab and back into the dish after triturating the substance with it, the operations of melting and mixing were done in a small mortar which fitted into the ring of the water bath. The substance was powdered finely in a mortar, the cocoa butter then added and the two kneaded into a uniform mass in the cold. The mortar was then partly immersed in warm water in a water bath (50°—70° C.) and the mass melted carefully with constant trituration and poured into the mould when creamy.

(3) No lubricant was used in any of the determinations, as it was realised that the use of a lubricant would introduce a factor liable to considerable variation. The mould was polished with a metal-polish and repolished when necessary throughout the determinations. The pessaries came quite clean out of the mould except in the case of a few substances.

(4) The finished pessaries, when cold, were trimmed with a razor, the surplus mass being removed in thin shavings to minimise the risk of fracture.

(5) Four holes of the mould were used, the mean capacity of which had been first determined. In each case 10 gm. of a 20-per-cent. mass was prepared and poured into two holes of slightly different capacities. The second calculation served as a check on the first, and in quite a number of instances identical or almost identical results were obtained from each. Where divergence occurred it was found in many cases to be due to the presence of vacuoles in either pessary. When vacuoles were found absent on cutting the pessaries transversely, to which each was subjected, a mean value for the density was taken unless the divergence was too large, in which case the density was redetermined. (A typical result is tabulated by the author.)

A uniform slab of cocoa butter was used, and in a few instances, such as that of chloral hydrate, 20 per cent. of white beeswax was included in the mass. The density of the wax was obtained separately, and the same sample was also used throughout when necessary. To avoid unnecessary calculation when applying the results in actual dispensing practice, a table showing the influence of density variations on the weight of cocoa butter displaced was used as a guide in stating results only to such figures as were significant for the particular density. The following is an alphabetical list of the substances whose densities were obtained as outlined :—

Acid. boric. ..	1.54	Gallæ pulv. ..	1.92
Acid. benzoic. ..	1.50	Hamamelin. ..	1.67
*Acid. carbolic. ..	0.92	Hydrarg iodid. rub.	4.0
Acid. gallic. ..	2.0	Ichthyol	1.10
Acid. salicylic. ..	1.37	Iodoform.	4.0
Acid. tannic. ..	1.63	Morph. hydrochlor.	1.65
Aloin.	1.34	*Ol.eucalypti(minims)	1.01
Alum.	1.77	Opii pulv. ..	1.46
*Bals. Peru. ..	1.15	Podophylli resin. ..	1.34
Bismuthi carb...	4.5	Potass. bromid. ..	2.25
Bismuthi salicyl.	4.5	Potass. iodid. ..	4.5
Bismuthi subnit.	6.0	Plumbi acet. ..	2.5
Borax	2.0	Plumbi iodid. ..	10.0
Cera alb. ..	0.90	Quin. hydrochlor.	1.22
*Choral hydras ..	1.32	*Salol	1.09
Chrysarobin. ..	1.52	Santonin.	1.35
Cupri sulph. ..	2.5	Zinci oleas ..	1.10
Ext. bellad. sicc.	1.34	Zinci oxid. ..	4.0
Ext. bellad. vir.	1.33	Zinci sulph. ..	2.8

* White beeswax was included in the mass containing each of these substances. Eucalyptus oil was determined on a 20 per cent. w/w mass also containing beeswax, and the density adjusted according to the mean gravity of the oil, so that the weight of cocoa butter displaced could be obtained directly by dividing the volume of oil in minims by the constant given above.

Some dispensers are tempted to use a little water to dissolve potassium bromide and other crystalline substances. The quantity required completely to dissolve crystalline substances is usually more than can be admitted, and if insufficient is added there is always the danger of crystallisation occurring in the finished suppository. There are a few instances in which the use of water could be sanctioned, in which the substance is sufficiently soluble and is usually present in small quantity. In such cases the determination of the density of the substance is complicated by the presence of the water, and as the substance is in solution it was assumed that the solution would displace the same weight of cocoa butter as an equal volume of water. The density of water was obtained in the usual way using a 20-per-cent. mass w/w, and a value of 1.07 for the sample of cocoa butter used was obtained. A mean value would be 1.05.

The following results were obtained :—

Argent. nitras 10 gr. dissolved in 10 minims distilled water.
Vol. of Sol. = 15 minims.

Cocain. hydrochlor. 10 gr. in 10 minims distilled water.
Vol. of Sol. = 13 minims.

Potass. iodid. 10 gr. in 10 minims distilled water.
Vol. of Sol. = 15 minims.

In finding the displacement of cocoa butter by these substances in solution, the volume of the solution according to the above results is divided by 1.55. The method could be extended to other substances.

DISCUSSION

The CHAIRMAN said that this was Professor Smith's first contribution to Conference proceedings. He hoped

BRITISH PHARMACEUTICAL CONFERENCE 1929

that it would be the forerunner of many on similar lines, as it was a paper of value to the practising pharmacist. The figures given for the space occupied by substances dissolved or suspended were much more complete than anything before put on record.

Mr. BRINDLE commented on the fact that for suppositories of carbolic acid the author had used beeswax. As beeswax separates out at from 50-60° the speaker said he had found it impossible to avoid overheating. He would like to know if this addition was really necessary.

Mr. BREWIS inquired as to the purity of cocoa butter used. It seemed to him that the precaution of using a new set of verified metric weights was taking excessive caution in one direction, while at the same time there were other sources of error. Some samples of the oil showed great variation.

Mr. L. G. WOOD said he never had trouble in incorporating wax in a suppository mass if it was an essential ingredient. The wax was melted first, the cocoa butter added, and then the medicament.

Mr. F. C. HIGHFIELD said that usually rule of thumb methods were used in the making of suppositories, and a certain amount of discretion was necessary to determine the volume that a liquid medicament would occupy. It was sometimes doubtful if the required amount of medicament was actually present in each suppository. There was a moral obligation in making the thing as accurately as possible, and there was the case of suppositories used in Insurance prescriptions. He suggested an amplified list for reference, but this would tend to make dispensing more troublesome, and he supposed that even then rule of thumb methods would still be used.

PROFESSOR SMITH, in reply, said beeswax was a necessary addition on account of the strength of the mass. For the density determination it was necessary to use a strong mass, as with 20 per cent. of phenol it was impossible to solidify it. His experience was that it was better to do without wax if possible. With regard to the constants of the cocoa butter used he would refer them to the work of White and Braithwaite. The samples had shown some variation. The s.g. limits given in the B.P. were narrow and probably not 10 per cent. of commercial samples would agree. He thought that he was justified in using stamped weights as errors were found in using ordinary weights. Variation of the capacity of each hole in the mould would be due to the lubricant used, e.g., soft soap. He had omitted lubricant and had polished the moulds. Reliable results were obtained by using cocoa butter alone. Errors of operation would influence results. A dispenser would accept a sample of cocoa as received from the wholesaler, and a sample of average density 0.970 would not cause much difference in any of the figures given.

The next communication was :—

The Making of Hollow Suppositories—A Modification of Morgan's Method

By THOMAS J. SMITH

[ABSTRACT.]

THE method first suggested by A. H. Morgan, as mentioned in "The Art of Dispensing," consists in pouring melted cocoa butter into a well-lubricated and iced mould, allowing the outer layer to become hard when the mould is inverted to allow the inner layer, which is still liquid, to flow out. After trimming the hollow suppositories the medicament is introduced into each, finally filling up with more melted cocoa butter. The method is very ingenious, but somewhat difficult to carry out successfully. The following modification is suggested :—

The mould is lubricated and filled with cocoa butter as before and the outer layer is allowed to solidify, but, instead of inverting the mould, the centre of the suppository is removed with a small dropping pipette. The tip of the pipette is heated for a distance of $\frac{1}{4}$ inch or so, by passing through a gas or spirit flame, before inserting into the suppository to prevent fat becoming solid during removal. Should the fat become solid in the pipette it is immediately liquefied by passing the pipette through the flame for a few seconds. The entire suppository may be allowed to become quite solid before removing the centre, as the hot pipette tip melts the cocoa butter on coming in contact with it. Liquefaction does not extend to the outer layer owing to the narrow stem of the pipette which passes vertically down the centre of the suppository as the upper centre layer is melted and removed. A further refinement, to prevent the removal of the apex of the suppository by inserting the pipette too far into the mould, consists in placing a narrow strip of gummed paper round the stem of the pipette at a suitable distance from the tip. The distance, in the case of the ordinary 15-gr. mould, would be about $\frac{5}{8}$ inch—that is about $\frac{1}{8}$ inch—$\frac{1}{4}$ inch short of the depth of the mould. In withdrawing the centre of the suppository the strip on the pipette is not allowed to go below the level of the top of the mould. The orifice of the hollow suppositories may be made as large as necessary by a reasonably skilful use of the pipette. The medicament is then introduced and the suppositories filled up as before. In using this method it is not essential that the mould should be chilled in case ice or other freezing material is not available. The preparation of suppositories containing 3 gr. of chloral hydrate in each, using this method, was given as an exercise to students of the School of Pharmacy (Pharmaceutical Society of Ireland). The chloral hydrate was introduced into each in fine powder, but on cutting the finished suppositories it was found inside as a fairly hard crystalline mass which would be likely to cause irritation in use. When next tried the powdered chloral hydrate was warmed gently in a small evaporating dish with an equal quantity of cocoa butter. The resulting liquid was dropped into the hollow suppository and the dish rinsed out with the further quantity of fat required to fill the suppository. The finished suppositories were quite satisfactory, and this method of introduction would seem advisable in the case of substances in powder. Liquids may conveniently be added from a graduated minim pipette. In the actual use of the pipette it is advisable to guide it vertically downwards with the thumb and forefinger of one hand with the arm resting on the bench, while the teat is released by the corresponding members of the other hand. Using one hand alone there is a likelihood of the pipette descending obliquely and damaging the outer surface of the suppository.

DISCUSSION

The CHAIRMAN remarked that this was an ingenious method, and had a further advantage in simplicity.

Dr. BRYANT said that in making hollow suppositories on a large scale he had hit upon the idea of using a card with pegs of glass or hard wood corresponding to the holes in the mould. This was dipped into the suppository mould half filled with cocoa butter. There was no danger here of puncturing the wall of the suppository.

Mr. HIGHFIELD did not regard this method of making suppositories as altogether satisfactory. Would the concentrated medicament in the centre cause irritation, or would it be as effective as a uniform mixture of cocoa butter and medicament?

Professor SMITH, in reply, stated that he was not competent to decide on the therapeutic effect of medicament in a hollow suppository. In making chloral hydrate suppositories the addition of white wax, as referred to in the previous paper, gave a satisfactory suppository.

The final paper read at this session was that on :—

The Stability of Syrupus, B.P.

By W. J. BEARDSLEY, PH.C., AND F. J. BOLTON

[ABSTRACT.]

ON testing a number of samples roughly by boiling with Fehling's solution it was confirmed that the latter was considerably reduced by most samples of syrup. As it was found that the usual method of titrating the invert sugar with Fehling's solution was extremely

BRITISH PHARMACEUTICAL CONFERENCE 1929

inaccurate when used with concentrated syrups, a survey of chemical methods of estimation and detection of invert sugar was made. The sucrose used in testing these methods was the same as that used in the manufacture of syrup—the best commercial cane sugar; pure anhydrous dextrose was used, and the invert-sugar solutions were prepared by the method of Pellet. The ferricyanide method of Jonescu-Matin was not applicable to simple syrup, as the ferricyanide was reduced to a slight, though varying extent by the sucrose—and the end-point was obscured by the blue coloration produced. Anabach & Bodlander's modification of Willstetter & Schudel's method of estimating dextrose by oxidation with iodine in alkaline solution, though accurate for solutions of pure dextrose or invert sugar, is not applicable to solutions containing large proportions of sucrose. Pure sucrose in the form of a 44.3 per cent. w/v solution (syrup diluted with an equal volume of water), was found to reduce iodine to about 1/400th the extent of an equivalent solution of dextrose; this reduction, however, was not constant, and the quantity of iodine absorbed by sucrose in mixtures of sucrose and invert sugar or dextrose varied inversely as quantity of dextrose present. Benedict's solution is only very slightly reduced by sucrose when the latter is added at a concentration of 44.3 per cent. w/v (simple syrup diluted with an equal volume of water). Employing Fehling's solution prepared by the formula of the B.P. and using methylene blue as internal indicator, the ordinary volumetric method was tried with syrups containing a known proportion of invert sugar, the syrup being diluted with an equal volume of water before use. End-points were fairly easily observed in this way, but the reduction due to the sucrose made the results very inaccurate. In order to determine the correction to be applied when using the gravimetric process, the approximate weight of cuprous oxide precipitated by syrup free from invert sugar at varying dilutions was found. The syrup was made without heating, and 25 c.c. was boiled with an equal volume of Fehling's solution, rapidly cooled, and filtered, the cuprous oxide on the filter paper being washed, dried at 110°, and weighed. The results indicate that the reduction increases with concentration of sucrose to a certain point, and then decreases, the maximum reduction in these estimations occurring at a concentration of 22 per cent. w/v of sucrose in syrup, also that reduction increases with time of boiling. It would thus seem possible to estimate the invert sugar by just boiling the reaction mixture, and weighing the cuprous oxide precipitated. It was ascertained, however, that results varied, and were usually lower than the calculated value.

Reliable results were obtained by employing a lower reaction temperature, the method used being a modification of that of Pellet. The syrup (10 c.c.) was heated with an equal volume of Fehling's solution on a water bath at 63° for ten minutes. Vessels of the same size (glass tubes of 6 in. length, 1 in. diameter) were always used; and the liquid after heating was filtered through paper supported on a metal ring. The precipitate was washed with water till free from alkali, and finally with alcohol; dried, ignited, converted to nitrate by a few drops of nitric acid, and again ignited and weighed as cupric oxide. Contrary to Pellet, who found no reduction at 63° with sucrose solutions, a small precipitate with syrups was invariably obtained equivalent to 0.0014 gm. of cupric oxide for 10 c.c. syrup, the results of a number of analyses being identical. It is not probable that this was due to invert sugar, as the filtrates obtained gave the same weight of precipitate on again heating for ten minutes at 63°. Further, it seems certain that reduction of Fehling's solution by sucrose occurs slowly at even lower temperatures; after standing for one week at room temperature 10 c.c. of pure syrup precipitated 0.0059 gm. of cuprous oxide from 10 c.c. of Fehling's solution. From a number of determinations, under the authors' conditions, the following table was drawn up, 0.0014 gm. having been subtracted from the weights of cupric oxide to allow for the reduction of sucrose :—

Per cent. w/v invert sugar in syrup	Cupric oxide obtained (gm.)	Cuprous oxide precipitated
0.01	0.0020	0.0018
0.025	0.0050	0.0045
0.04	0.0090	0.0081
0.05	0.0108	0.0097
0.075	0.0175	0.0157
0.10	0.0241	0.0217
0.15	0.0365	0.0328
0.20	0.0489	0.0440
0.30	0.0718	0.0646
0.40	0.0947	0.0852

By reference to this table, contents of invert sugar down to 0.01 per cent. could be accurately estimated. Loss in the process by the carrying of oxide through the filter-paper was generally negligible, but could, if necessary, be minimised by passing the filtrate through a second time. Error, due to the absorption of alkali by the paper, was eliminated by applying the correction from the blank test. At low concentrations (below 0.03 per cent.) the approximate invert-sugar content could be ascertained by comparing the stain on the filter-paper with standard stains. The precipitates were bluish-green below 0.03 per cent., green at 0.05 per cent., greenish-yellow at 0.1 per cent., brick-yellow at 0.2 per cent., orange at 0.3 per cent.

The invert-sugar estimations, in the work that follows, were carried out with Benedict's solution in concentrations above 0.25 per cent., and by the gravimetric method at concentrations below this figure. The method of making syrup in bulk was to heat the sugar with half its weight of distilled water in a steam-jacketed pan, stirring till the sugar had dissolved (usually at a temperature of 90°), boiling, skimming to remove impurities, cooling and bringing to the correct specific gravity (1.33) by the addition of distilled water. By extracting samples at various stages in this process, we found that there was scarcely any hydrolysis till a temperature of 100° had been reached, but that inversion increased most rapidly on boiling and immediately afterwards, the final content of invert sugar varying from 0.15 to 0.5 per cent. by weight. The cause of this variation is uncertain, but the reducing sugars present appeared to vary fairly regularly with the PH value of the syrup. The PH value, determined by the colorimetric method, was usually above 7.0 before boiling, but fell on further heating, the PH of the finished syrup lying between 4.5 and 6.5. It was generally found that syrups having the greatest hydrogen-ion concentration contained the most invert sugar. When, on the other hand, the same sugar and water was used to make a small quantity of syrup, say 300 gm., hardly a trace of invert sugar was formed. The chief difference between the two methods of manufacture was that the larger bulk was of necessity heated for a much longer period. A number of samples of simple syrup were made in the cold, no heat whatever being applied. Each was completely free from invert sugar. Several samples of 300 gm., made by just bringing the syrup to the boil, contained between 0.004 and 0.008 per cent. of invert sugar. In order to determine the effect of heating on a syrup about 2,000 gm. was made in a small copper vessel, under conditions resembling those on the large scale. (The authors give their results in detail.) The conclusions to be drawn appear to be that the proportion of invert sugar in a syrup depends on (*a*) the extent to which it has been heated; (*b*) the conditions determining its PH value. It will depend also on the purity of the sugar used and, probably, on the exact concentration of the sucrose in the solution during heating. It does not seem probable that, as has been suggested, the PH value of the water used has, within limits of PH 5-9, any effect on the inversion.

The decomposition of syrups on keeping depends on the conditions of storage. A syrup exposed to the access

BRITISH PHARMACEUTICAL CONFERENCE 1929

of ferments and bacteria will be more likely to suffer inversion than one protected from these organisms. Syrup containing 0.2 per cent. of invert sugar, and having a PH of 6.5, was placed in a wooden cask which had previously contained syrup, and had a definite odour of fermentation. After five days it contained 0.44 per cent. of invert sugar, and the PH had fallen to about 4.0; after eight days the invert sugar had risen to 1.02 per cent. A number of samples of syrup were made and put up in stoppered white bottles; they were kept at laboratory temperature, portions being taken out and examined from time to time. (The proportion of invert sugar in the syrups is expressed by the authors as percentage by weight.) It is apparent from these results that, except where an organism has gained access, inversion only proceeds slowly. The alkaline sample contained no invert sugar after six months. Further samples were put up. The results obtained confirm that, when no ferment has gained access and the syrup is neutral, inversion proceeds only very slowly, practically no change being noted after six weeks. A 50-per-cent. solution of sucrose having PH 7.7 developed in a fortnight 0.45 per cent. of invert sugar, the PH value falling to 5.2. A 20-per-cent. solution contained after standing for the same period 0.28 per cent. of invert sugar. The decomposition in both cases was accompanied by the formation of growths.

SUMMARY

(1) A survey of chemical methods of estimating invert sugar in simple syrup has been made.

(2) The degree of inversion of sucrose occurring during the manufacture of syrups has been found to depend on the extent to which the syrup is heated and on the conditions determining the PH value of the syrup.

(3) The formation of invert sugar in syrup on keeping has been found to proceed very slowly, except when an organism had gained access, or the acidity was high. In these cases decomposition was much more rapid.

(4) There can be no doubt that the best temperature for producing a syrup practically free from invert sugar is 90° C.

The work for this paper was carried out in the laboratory of Thomas Hodgkinson, Prestons and King.

DISCUSSION

Mr. BENNETT said the members were indebted to the authors for being the first to put on record the extent to which invert sugar occurs in syrup of the pharmacopœia. It was shown that the degree and speed of inversion is dependent on the degree of heat to which the syrup is subjected and the acidity.

Mr. R. E. JACKSON advocated the preparation of simple syrup by percolation, using a large crystal sugar, as this process resulted in the almost complete absence of invert sugar, for the production of which the steam pan was mainly responsible when the syrup is prepared in the general way. Syrup prepared by percolation was less liable to fermentation.

Mr. HENNEMAN inquired as to the process of manufacture with the retailer.

Mr. BREWIS referred to the determination of invert sugar in strong sugar solutions and the difficulty met with when a small quantity of invert sugar was present. Precipitates with Fehling's solution did not come down in the usual way. This was noticed many years ago in testing raw beet sugars which contained only small amounts of invert sugar. He asked whether in estimating with Fehling's solution the author used solutions as weak as 2-5 per cent. In sugar solutions and urine where the content of invert sugar was very low the copper did not come down in characteristic red precipitate. To avoid this the way adopted was to add a measured volume of a standard solution of invert sugar to the solution weak in invert sugar, titrate the mixture against Fehling's solution, making a deduction for the invert sugar added. The standard solution was made by inverting a known weight of sucrose with hydrochloric acid neutralising with sodium bicarbonate and making up to known volume. Referring to the keeping of syrups, strong solutions kept well, but a difficulty was introduced when water evaporated, condensed, and ran back forming a layer of weaker syrup on the surface, which was a suitable medium for the growth of moulds. It was also necessary in order to get a white syrup to use big crystals polarizing 99.97°-99.98°.

Mr. FRANKLIN asked what disadvantage did a small quantity of invert sugar cause in syrup.

Mr. WALMSLEY said that commercial sugar contained impurities, and the sweetening power of sugar seemed to be due to the presence of these. The volumetric estimation of invert sugar was not accurate. The gravimetric estimation was the most accurate. Had Mr. Beardsley shown that the Fehling's solution did not give a reduction itself? It was difficult to get samples which did not show reduction. He referred to the process of inversion in presence of acid and in concentrated solution, and questioned the author's figures as to the invert sugar content given in the table. He thought that a small quantity of invert sugar was of no importance.

Mr. D. G. MACKENZIE asked if presence of air in a bottle had any effect on the keeping properties of syrup. He had found syrup to keep well with a plug of cotton-wool in the bottle neck.

Mr. BEARDSLEY, replying, said that he saw difficulties in the percolation process, even when large crystals were used. He thought that they would cake and form a mass. Referring to estimation of Fehling's solution, he did actually prepare a solution of invert sugar of known strength. The growth of moulds in a weak sugar solution was due to evaporation and condensation. This would occur in a warm room, and could be obviated by proper storage. A boiled syrup would crystallise, but a syrup made in the cold would not crystallise. He thought that invert sugar effected the keeping properties, and it was an advantage to have a syrup free from invert sugar, as many pharmacists made their medicated syrups from concentrated liquors and simple syrup.

Science Section—Wednesday Morning

For the first hour of the science meeting on Wednesday morning the attendance was augmented by a large number of delegates. The first paper (read by Mr. Walmsley) was :—

Some Notes on the Determination of Nitrates in Bismuth Carbonate

By G. J. W. FERREY, B.Sc., A.I.C.

[ABSTRACT]

THE method of the B.P. 1914 for the determination of nitrate impurity in bismuth carbonate is based on the action of phenoldisulphonic acid on the nitrate present, and the subsequent colorimetric estimation of the yellow ammonium salts of the nitrophenols so produced. Although this method has given, and still gives, good service in water analysis, and has in recent years been applied to the determination of nitrates in soil, the results obtained in the case of bismuth carbonate appear on the whole to have been unsatisfactory. In many laboratories the official method has been replaced by the indigo-carmine method, which depends on the oxidation and decolorisation of indigo-carmine by nitric acid at a high temperature in sulphuric acid solution.

CONTROL METHOD

For the purpose of testing the two methods it was necessary to select a process entirely different in principle from either. The method using Devarda's alloy and the official method of the Board of Agriculture and Fisheries, found to give reliable results in the determination of nitrate in bismuth subnitrate, were tested on three samples of bismuth carbonate, and the latter method selected. The method is now an official method under the Fertilisers and Feeding Stuffs Act, 1926.

BRITISH PHARMACEUTICAL CONFERENCE 1929

Both methods depend on the reduction of the nitrate to ammonia by nascent hydrogen. In the present work the ammonia distilled was collected in 10 c.c. of $N/10$ hydrochloric acid instead of 50 c.c. and methyl red was employed as indicator. 5 gm. of bismuth carbonate was used for each determination. The results obtained by the two methods are given :—

	Board of Agriculture and Fisheries	Devarda's alloy
	c.c. $N/10$ HCl per 10 gm. reduced iron	c.c. $N/10$ HCl per 8 gm. Devarda's alloy
Blank ..	0.45	0.2
„ ..	0.45	0.3
„ ..	0.45	0.3
Sample	$BiONO_3.H_2O$ per cent.	$BiONO_3.H_2O$ per cent.
1	2.70 .. 2.66	2.86 .. 2.73
2	2.03 .. 1.98	2.18 .. 2.39
3	3.40 .. 3.42	3.60 .. 3.85

Although the blank test on the reduced iron is somewhat high, it is a remarkably constant figure for any given batch. The accuracy of the method selected for the determination of small quantities of nitrate ranging from 0.01 to 0.05 gm. (the proportion usually occurring in 5 gm. of commercial bismuth carbonate) was then tested on a solution of pure potassium nitrate containing 1 gm. per litre. The maximum error found was 1.1 per cent., practically within the error due to reading the burette. It was found unnecessary to follow exactly the official directions as to timing.

Phenoldisulphonic Acid Method

As the B.P. test is essentially a limit test, it is concerned with quantities of bismuth subnitrate of the order of 2 per cent. If the colour of the test solution is compared with the colour given by 0.00013 gm. of potassium nitrate in 100 c.c. (as in the B.P. test) accurate results cannot be expected where the nitrate content differs much from 2 per cent. owing to the difficulty of matching the colours of columns of liquid differing greatly in height. The limits of nitrate which can be compared with the B.P. standard colour without this source of error coming into play are approximately 1.4 and 3.0 per cent. For this reason investigations of the errors of the B.P. test must be carried out on percentages within these limits.

In this laboratory the B.P. method is applied as follows :—0.02 gm. of bismuth carbonate is weighed out in a round-bottomed glass dish, placed on a boiling-water bath, and five drops of phenoldisulphonic acid added. The mixture is stirred with a small glass rod and removed from the bath after exactly one minute. The mixture is allowed to stand for four minutes, stirring occasionally, and then treated with 10 c.c. of 10-per-cent. ammonia. The ammoniacal solution is filtered into a 100-c.c. cylinder and made up to the mark. At the same time 1 c.c. of a solution of potassium nitrate (containing 0.13 gm. per litre) is pipetted into the centre of a similar glass dish, evaporated to dryness on the water bath, and then treated in exactly the same way as the bismuth carbonate, filtration before making up to volume being, of course, omitted. The two solutions thus prepared are transferred to carefully matched 100-c.c. Nessler cylinders and compared by viewing downwards over a thick white filter paper held obliquely at a short distance beneath the cylinders. The colours are then matched by pouring the necessary quantity from the tube showing the deeper tint. This method was used throughout the following work except where otherwise indicated.

The main criticisms which have been levelled against the B.P. method are the difficulty of weighing out 0.02 gm. of bismuth carbonate accurately, wetting completely 0.02 gm. of the carbonate with 5 drops of the reagent, wetting completely the film produced by the evaporation of 1 c.c. of potassium nitrate solution, and loss in strength in keeping of the dilute potassium nitrate solution. Further possible sources of error are due to pipetting the small quantity (1 c.c.) of standard nitrate solution, the presence of chloride in the bismuth carbonate, and errors in matching the colours of the yellow ammoniacal solutions. Each of these sources of errors is considered.

It is difficult to assess exactly the error due to weighing out the small quantity of bismuth carbonate, but with an accurate balance turning to 0.1 m/gm. it seems possible to weigh out accurately to within 0.0005 gm. This would correspond to a maximum error of ± 2.5 per cent. In dealing with the difficulty of wetting completely 0.02 gm. of bismuth carbonate with the prescribed quantity of reagent, it is first necessary to refer to the effect of heating the carbonate with the reagent for one minute. While this step is not mentioned by the B.P. it has been found to give more consistent results than are obtained by allowing to stand the whole five minutes in the cold. The figures obtained by heating are also slightly higher, but prolongation of the heating over one minute has no appreciable effect.

Sample	No heating	Heating for 1 minute	Heating for 3 minutes
	$BiONO_3.H_2O$ per cent.	$BiONO_3.H_2O$ per cent.	$BiONO_3.H_2O$ per cent.
1	2.66	2.80	2.80
2	2.40	2.60	2.63
3	1.85	1.95	1.90

With pure potassium nitrate, heating for one and three minutes does not give a deeper colour than that given by a test carried out entirely in the cold. Two sets of tests performed on 0.00013 gm. heating for 0, 1, and 3 minutes showed no appreciable differences in depth of colour. The differences observed in bismuth carbonate appear to be due to the clotting of bismuth carbonate when wetted by the reagent, and the higher temperature assists the action of the glass rod in breaking down these clots, and allowing the reagent to have full affect. The use of a glass dish in preparing the standard is convenient, as by viewing over a dark surface the minute film of potassium nitrate and its complete wetting by the reagent can readily be seen, whereas if a porcelain dish is used this is practically impossible. Loss of strength of the dilute potassium nitrate solution is not a source of serious error. A dilute solution of potassium nitrate containing 0.130 gm. per litre was prepared for the purpose of routine tests. Four months later, 50 c.c. was treated by the control method, and the ammonia distilled neutralised 6.3 c.c. of $N/100$ hydrochloric acid (theoretically 6.43 c.c.). The difference is negligible, and it therefore seems unnecessary to prepare fresh dilute solution of potassium nitrate for each determination. The error due to pipetting 1 c.c. of dilute potassium nitrate solution is very small, as the following five determinations of the weight of water delivered by a 1 c.c. pipette illustrate :—1.0027, 1.0039, 1.0003, 0.9996, 1.0032 gm. The greatest difference between the weighings is 0.0043 gm., and the error due to pipetting 1 c.c. is therefore less than 0.5 per cent. It has been shown that the presence of chloride in a water residue may have a serious effect of the determination of nitrate by phenoldisulphonic acid, and no error is caused by the presence of chloride (as chlorine) in amount less than about six times the amount of nitrogen as nitrate. As the chlorine in bismuth carbonate seldom exceeds 0.1 per cent., error due to chloride is unlikely. This was confirmed by evaporating 0.15 c.c. of $N/100$ sodium chloride to dryness in a glass dish, adding 0.02 gm. of a sample of bismuth carbonate free from chloride, and carrying out the B.P. test on the mixture. The result was 1.4 per cent., as $BiONO_3.H_2O$; a test on the sample without added chloride gave exactly the same result. The chloride added is equivalent to 0.25 per cent. chlorine, approximately. The difficulty of correctly matching the yellow colour of the ammoniacal

BRITISH PHARMACEUTICAL CONFERENCE 1929

solutions is the main source of error in the phenoldisulphonic acid method. A series of experiments shows that if care is taken to carry out the matching in a good light the error is small. Results depend to some extent on the colour sense of the observer, and fatigue plays some part. Thirty-six tests fall into the following groups:—

Error per cent.	Number of tests	Error per cent.	Number of tests
None	1	± 6 to ± 7	6
Under ± 2	5	± 7 to ± 8	1
± 2 to ± 3	6	± 8 to ± 9	1
± 3 to ± 4	1	± 9 to ±10	1
± 4 to ± 5	6	±10 to ±11	2
± 5 to ± 6	5	Over ±11	1

Thus 52.8 per cent. of the tests showed errors under 5 per cent.; 83.3 per cent. errors under 7 per cent.; 91.7 per cent. errors under 10 per cent., and 8.3 per cent. errors over 10 per cent. Of the tests showing errors under 5 per cent., 15 were carried out in good light, and 4 in poor light on a dull, wet afternoon. Of those showing errors between 5 and 7 per cent., 3 were done in fair to good light, 7 in poor light, and 1 in good light. Of those with errors over 7 per cent., all six were carried out in poor light (2 after 5 p.m., and 4 on a dull, wet afternoon). The factor giving rise to the greatest error in the phenoldisulphonic acid method is the difficulty of matching the colours of the ammoniacal solutions, and is primarily due to insufficient attention being given to the quality of the light at the time of the test. With due attention to this factor, it is possible to ensure that the error due to this cause is less than 5 per cent.

Total Error of the B.P. Test

By a careful selection of suitable conditions, the maximum error in the estimation of nitrates by the phenoldisulphonic acid method need not be much above 5 per cent., and results obtained by different workers need not differ by more than a like amount. The greatest error in the results obtained by this method on commercial specimens of bismuth carbonate is − 7.8 per cent.

The Indigo-Carmine Method

In determining the probable error to be expected when using this method, 25 c.c. of concentrated sulphuric acid was added quickly in one portion, but in the following experiments the 25 c.c. of acid was added in two approximately equal portions. This is simply a matter of convenience, as when the whole 25 c.c. of acid is added in one portion to 0.5 gm. of bismuth carbonate the decomposition of the carbonate and the heat generated by the mixing of the acid and water produce a violent effervescence. It is essential that the indigo-carmine solution be standardised in the same way. The standard-indigo-carmine solution was standardised against a solution containing 1 gm. pure potassium nitrate in 1 litre by pipetting x c.c. of the latter solution into a 250 c.c. wide-mouthed flask, adding $(25-x)$ c.c. of water, rapidly adding 25 c.c. of concentrated sulphuric acid in two equal portions, and immediately adding the indigo solution from a 25-c.c. burette.

Obviously, no error need arise in carrying out the test up to the moment of titration, as there is no difficulty in ensuring that precisely the same volumes of nitrate solution and sulphuric acid are always mixed in precisely the same way. It appears to be unimportant to add the acid in two exactly equal portions, errors of 1 or 2 c.c. in dividing the solution showing no effect on the result. In carrying out the standardisation on the lower percentages of nitrate (up to 5 c.c. of 0.1-per-cent. potassium nitrate solution) no difficulty was found in obtaining good duplicates, but above this limit difficulty was experienced in obtaining concordant results, and these were usually low. It was found that the decolorisation of the indigo-carmine became slower after the addition of about 4 c.c. at a moderate rate. After some experiments it became obvious that working under the conditions specified higher results were obtained when the titration was rapid than when it was slow. It was further found, similarly low results could be obtained on the lower percentages of nitrate if the titration was carried out slowly.

c.c. 0.1 per cent. potassium nitrate solution	c.c. Standard indigo solution	
	Rapid	Slow
1	0.75	0.75
2	1.5	1.3
4	3.0	2.7
5	3.7	3.4
6	4.4	4.2
8	5.9	5.5
10	7.5	7.2

The obvious explanation of the slower decolorisation of the indigo and the comparatively lower results at the higher concentration of nitrate was that the temperature of the reaction mixture was of importance, and that the somewhat rapid cooling quickly led to a slowing down of the reaction between the indigo and the nitrate. A series of tests showed that on mixing 25 c.c. of water with 25 c.c. of concentrated sulphuric acid (in two equal parts), as in the test, the temperature rose to 125-130° C. and then fell in approximately sixty seconds below 115° C. A further series of tests on 5 c.c. of 0.1-per-cent. potassium nitrate solution *plus* 20 c.c. of water showed that low results were obtained when the final temperature of the solution fell below approximately 115° C. With the addition of the 3.7 c.c. of cold indigo solution necessary for the titration, this fall in temperature occurred in about 45 seconds. Working under the conditions specified, therefore, it is essential that the titration shall occupy not longer than about 40 seconds. If this condition is observed very consistent results can be obtained. 1 c.c. of potassium nitrate solution = 0.7426 c.c. indigo solution. The figures obtained illustrate the degree of accuracy that may be expected from the indigo-carmine method and show that both the standard indigo-carmine solution and potassium nitrate solution are quite stable, since a period of two and a-half months produced no change in the mean value of 1 c.c. of the potassium nitrate solution in terms of indigo solution. Care was taken to ensure that the

Sample	Phenol-disulphonic acid method	Indigo-carmine method	Board of Agriculture and Fisheries method
	$BiONO_3.H_2O$ per cent.	$BiONO_3.H_2O$ per cent.	$BiONO_3.H_2O$ per cent.
1 ..	1.5	1.42	1.52
		1.49	
2 ..	2.8	2.85	2.93
3 ..	2.8	2.85	2.78
		2.73	
4 ..	2.5	2.63	2.70
	2.5	2.63	2.66
5 ..	2.6	2.80	2.79
			2.83
6 ..	3.3	4.0 (*a*)	4.03
		4.0 (*b*)	4.07
7 ..	5.0	5.4 (*a*)	6.45
		5.4 (*a*)	6.40
		6.3 (*b*)	
8 ..	2.0	2.19	2.17
	2.1		
9 ..	2.0	2.00	2.03
	1.9		1.98
10 ..	1.8	1.82	1.90
11 ..	2.0	1.83	2.10
	2.0		
12 ..	1.6	1.62	1.54
13 ..	1.0	0.80	0.88
	0.7		

(*a*) Using 0.5 gm. bismuth carbonate.
(*b*) Using 0.2 gm. bismuth carbonate.

BRITISH PHARMACEUTICAL CONFERENCE 1929

titration was completed within 40 seconds. This is not an easy matter where the addition of more than 5 c.c. of standard indigo solution is necessary. In general, therefore, it is to be expected that where the nitrate content requires the addition of more than 5 c.c. of indigo solution the results obtained will be low. The actual limit as bismuth subnitrate above, which accuracy cannot be relied upon, will, of course, depend on the weight of bismuth carbonate taken for the test and the actual nitrate value of the indigo solution. With the indigo solution employed in the work recorded this limit is about 4 per cent., as bismuth subnitrate when 0.5 gm. of bismuth carbonate is taken for a test. Where results above 4 per cent. are indicated the test should be repeated on 0.2 gm. of bismuth carbonate. This will, of course, raise the limit for accuracy to about 10 per cent. of bismuth subnitrate, but the use of 0.2 gm. of sample where the nitrate content is low is not to be recommended on account of the very small amount of indigo solution which would be required.

The value and accuracy of the indigo-carmine method when the above limitations are borne in mind are well illustrated by comparison of the results on actual commercial specimens of bismuth carbonate. In many cases the results were obtained in the course of routine analysis.

Summary

The official method of the Board of Agriculture and Fisheries involving the reduction of nitrate to ammonia by reduced iron and dilute sulphuric acid is shown to give accurate and consistent results when applied to the determination of nitrates in bismuth carbonate. This method has given better results than reduction by Devarda's alloy. Possible sources of error in the phenoldisulphonic acid method as applied to bismuth carbonate have been investigated; the main source of error is shown to be due to the matching of the ammoniacal solutions, but this may be reduced to small proportions by due attention to the quality of the light at the time of the test. Conditions necessary for accurate results when using the indigo carmine method are indicated, and results of tests on commercial samples of bismuth carbonate by the penoldisulphonic acid and indigo-carmine methods are compared with those obtained by reduction of the nitrate to ammonia by reduced iron in acid solution. Limits of nitrate content in bismuth carbonate are given beyond which accuracy cannot be expected when using the B.P. phenoldisulphonic acid method and the indigo carmine method. The work recorded was carried out in the analytical laboratory of James Woolley, Sons & Co., Ltd., and the author is indebted to the directors for permission to publish the results.

Discussion

The CHAIRMAN said this was an interesting paper to those whose business it was to test bismuth subcarbonate, particularly in view of pharmacopœial revision. The custom in most laboratories was to use the indigo-carmine method in preference to the B.P. method.

Mr. JONES said that the paper dealt with a question before many analysts. Mr. Bennett had said that the indigo-carmine method was used in many laboratories. Commercial standards must be met, and it was difficult if different types of test were used. He suggested that the Pharmaceutical Society should undertake the examination of methods, and adopt a standard test. One analyst's method should not be adopted, and an average or limits should be fixed, but there was a danger in fixing limits. Estimation of the amount of nitrate in bismuth carbonate was not simple. It was difficult to get a homogeneous mixture for analysis, particularly in dealing with large quantities of substance. He dealt with the accuracy of sampling, and suggested that a few mgm. of substance should not be used to appraise lots of a few tons. Bismuth carbonate could not be made on a modern manufacturing scale to answer the official requirements as it could on a laboratory scale. Mr. Jones referred to the chemical and physical condition of a substance. There was a demand commercially for substances having a certain physical condition. Commercial standards were demanded. With regard to nitrates present, these were not necessarily washable.

Mr. WALMSLEY, in reply, stated that there were no legal limits, and no official method of testing. Nitrates in fertilisers were subject to official tests, and standards were laid down. He hoped that there would be a standard test in the new B.P. satisfactory to all.

In the absence of the authors, Mr. R. R. Bennett read the next paper, which dealt with :—

The Petroleum Spirit Test for Purity of Castor Oil

By T. TUSTING COCKING and SYDNEY K. CREWS

[ABSTRACT]

THE test for Oleum Ricini in the British Pharmacopœia is an elaboration of that official in the 1898 Pharmacopœia, which was criticised by F. C. J. Bird and E. W. Lucas in 1910. They stated that the test had been frequently pointed out to be inaccurate, but they gave the opinion that with the modifications devised by Dick the test was probably of value, and the wording as at present official was included in their recommendations for the B.P. 1914. The B.P. test is based upon the fact that other fixed oils are more soluble than castor oil in petroleum spirit, and their presence consequently depresses the clearing point of a mixture of castor oil and petroleum spirit. However, many genuine castor oils will not conform to the conditions of the pharmacopœial test; in some cases the mixtures require warming to 30° before they become clear. The object of the present note is to show that the failure of the test is due to variation in the composition of the petroleum spirit.

Petroleum spirit (petroleum ether), as defined in the appendix to the Pharmacopœia, may be assumed to consist principally of iso-pentane (b.p. 30°), normal pentane (b.p. 36.2°), iso-hexane (b.p. 62°), and normal hexane (b.p. 69°), with possibly small quantities of heptanes boiling between 90° and 98°. Petroleum spirit of commerce usually contains small quantities of hydrocarbons of the aromatic series, but no mention of these is made in the Pharmacopœia, nor are tests given to ensure their absence. Nevertheless, the presence of a small quantity of benzene—the lowest member of the aromatic hydrocarbons—in petroleum spirit increases considerably the solubility of castor oil in this solvent, and thus it has a marked influence upon the result of the castor oil solubility test. In order to study the effect of aromatic hydrocarbons on the test a quantity of petroleum spirit 50°/60° was treated with sulphuric acid, and after washing and drying, refractionated and the fraction 50°/60° collected. This had a specific gravity of 0.673, and when tested by Tizard and Marshall's method, less than 0.2 per cent. of aromatic hydrocarbons was included. When seven volumes of this petroleum spirit was mixed with ten volumes of castor oil, a clear mixture was obtained at 15.5°. On the addition of a further three volumes of the petroleum spirit a turbid mixture resulted which did not become clear until the temperature was raised to 26.9°. On cooling the mixture became turbid again at 26.5°. Varying amounts of an aromatic hydrocarbon (benzene) were added to the petroleum spirit and the test repeated. It was found that the addition of as much as 4 per cent. of benzene was required before the clearing point was lowered to the B.P. figure of 21°. The turbidity point then became 20.5°. These results indicate that the composition of the petroleum spirit used when the castor oil test was devised could not have conformed strictly to the description in the B.P. appendix, that is, " a mixture of the lower members of the paraffin series," but that it must have contained an appreciable amount of aromatic hydrocarbons. Petroleum spirit is more carefully refined at the present time than it was when the Pharmacopœia was written; and it seems obvious that

BRITISH PHARMACEUTICAL CONFERENCE 1929

if the test is to be retained, the solvent used must be more carefully characterised. Since petroleum spirit B.P. consists of a variable mixture of pentanes, hexanes, and heptanes, it was thought that the use of one of these hydrocarbons might give better results, and experiments were therefore carried out using these as solvents.

Equal volumes of pentane and castor oil did not produce a clear mixture even at 27°, at which temperature the mixture began to boil. The addition of more oil produced a clear solution, the critical quantities at 21° being 17 volumes of oil and 10 volumes of pentane. This mixture became turbid on cooling to 16°. A mixture of equal volumes of heptane and castor oil was clear at 6.0°, but turbid at 5.5°. Removing the aromatic hydrocarbons by means of sulphuric acid and repeating the test with the purified heptane resulted in a clearing point of 14.5° and a turbidity point of 14.0°. A quantity of hexane, purified by treatment with sulphuric acid to remove the aromatic hydrocarbons, was used as the solvent in a number of tests. Experiments were also carried out with a specially purified normal hexane, such as is used for absorption spectograph work. This solvent is spectroscopically free from aromatic hydrocarbons, and is now available for all purposes where even a trace of aromatic bodies is objectionable. The results obtained with these two solvents showed no appreciable difference. In carrying out the above tests the following method of procedure was adopted because of the difficulty of measuring a viscous liquid like castor oil with a reasonable degree of accuracy. The apparatus used consisted of a stout walled test tube, 25 mm. in diameter and 100 mm. long, fitted with a wire loop for suspending from the stirrup of a balance, and provided with a well fitting cork through which projected a thermometer. The tube was tared and about 10 c.c. of the castor oil poured in and weighed; the volume of the oil being obtained by dividing the weight by the specific gravity (mean value of 0.965 taken). The hexane was measured into the tube from a burette, the cork with thermometer attached placed in position and the mixture shaken and gently warmed until a clear solution was obtained. The tube and contents were allowed to cool slowly, shaking gently until the first sign of turbidity appeared when the temperature was noted. This point was taken as the "turbidity point." The tube was again very gently warmed until the mixture became clear, the warmth of the hand being usually sufficient for this purpose. The temperature at this point was taken as the "clearing point." In every case the difference between these two points was less than 1°.

Graphs are given showing (1) the clearing point curve of 10 volumes of castor oil with from 6 to 15 volumes of hexane; (2) the clearing point curve of 10 volumes of castor oil and 10 volumes of a solvent prepared by adding varying amounts of an aromatic hydrocarbon (benzene) to the purified hexane; (3) the clearing point curve of 10 volumes of castor oil containing varying amounts of olive oil with 10 volumes of the purified hexane. Determinations of the clearing points of mixtures of equal volumes of castor oil and the purified hexane were carried out on a large number of samples from various sources. Temperatures varying from 22.3° to 31.8° were obtained on thirty-three samples with an average figure of 26.3°. All these samples gave normal figures for acid, saponification, iodine and acetyl values, and there appeared to be no corresponding variation between any of these figures and the clearing point.

Conclusions

These results indicate that pure castor oil will not satisfy the requirements of the pharmacopœial solubility test unless the petroleum spirit contains some aromatic hydrocarbon. Such petroleum spirit does not conform to the pharmacopœial description. With the use of pure hexane as a solvent, the clearing points showed a divergence of as much as 9.5° for different samples of genuine oils. A clearing point of 22.3° given by one genuine oil corresponds with that given by another genuine oil admixed with 9 per cent. of olive oil. We consider that whatever solvent is used, the limits of the test are too wide to justify its retention in the Pharmacopœia. The above work has been carried out in the laboratories of The British Drug Houses, Ltd.

Discussion

The Chairman said that this paper served to emphasise the importance of reagents in carrying out pharmacopœial tests. Here they had a definition of a reagent that it did not receive when the B.P. 1914 was in course of preparation.

Mr. Brewis said how the test came to be in the pharmacopœia nobody knew; one reason being possibly that petroleum ether is a fraction of a complex series of bodies selected on its boiling point, which alone was not sufficient to identify this liquid as a reagent. Its great importance in connection with this test has been previously noted by Taber and Stevens ("Industrial and Engineering Chemistry," November, 1928), who pointed out that the paraffin hydrocarbons have a limited although high solubility in castor oil, while the olefines and aromatic hydrocarbons seem to be miscible in all proportions in this oil. It is interesting to note that in the examination of ext. filicis liq. for castor oil adulteration the use of petroleum ether had been suggested, and this was based on the alleged insolubility of castor oil in the petroleum spirit. The speaker endorsed the remarks of Mr. Jones regarding standards (*see* previous paper), and considered it would be well if samples were circulated. Discrepancies in connection with their results as found by committees of competent analysts had been astonishing, even when working on the same process, and it was only after considerable investigation that they had obtained concordant results. For tests to be embodied in the pharmacopœia, bulk quantities of preparations should be made and samples circulated to pharmacists, public analysts, and to others capable of examining them for their suitability and accuracy. Tests in pharmacopœias are essentially empirical owing to the character of the preparations involved. Added to this there is the inherent difficulty of obtaining "fair average samples."

Mr. Walmsley suggested that among the tests which might be included in the next pharmacopœia is the optical rotation. He also pointed out that the acetylation value would give added safeguards against other fixed oils.

The next paper was :—

Some Notes on Our Native Materia Medica

By M. V. Sargent, A.R.C.Sc.I., A.I.C.

[Abstract]

Medicinal Plants

Our native materia medica is very similar to that of England, but whereas in Britain the collecting and cultivation of medicinal plants are carried on to some extent at least, here in Ireland, so far as I have been able to ascertain, both are neglected.

Digitalis Purpurea.—This important plant is very freely and widely distributed, especially in the hilly non-limestone districts. In County Wicklow last August I found thousands of acres of the mountain side covered with plants in full bloom. A sample of tincture prepared from the leaves was sent to the Pharmacological Laboratory of the Pharmaceutical Society of Great Britain for biological test. The result was eminently satisfactory—the tincture being certified as equivalent in activity to the international standard.

Filix Mas.—In Ireland, at all events, this is a most important drug. The liquid extract is recommended by the Department of Agriculture as a specific for liver fluke in sheep and cattle. During 1927 many cwt. of the liquid extract was imported. The male fern is very freely distributed throughout Ireland. Probably, with the exception of the bracken, it is our commonest fern. In County Wicklow early in January I collected some very fine rhizomes. The drying presents some difficulty. From the carefully trimmed and powdered

BRITISH PHARMACEUTICAL CONFERENCE 1929

rhizomes a liquid extract was prepared, which on analysis gave 24.6 per cent. of filicic acid. The yield of liquid extract was 6½ per cent. of the powdered rhizomes.

Belladonna and Aconite may be found growing wild in many parts of the country, but scarcely in sufficient quantities to justify collection on a commercial scale. A sample of aconite roots obtained from the Botanic Gardens, Glasnevin, when dried and powdered, gave on analysis 0.64 per cent. of ether-soluble alkaloids. This is very satisfactory, the B.P. minimum limit being 0.4 per cent. A sample of belladonna roots obtained from the same source gave 0.34 per cent. of alkaloids. The B.P. does not require any definite percentage of alkaloids. The B.P.C. states between 0.3 per cent. and 0.6 per cent., while the United States Pharmacopœia requires 0.45 per cent. The belladona root under examination was obtained from what appeared to be very old root-stocks. It was also collected in the early spring. These facts may account for the somewhat low yield of alkaloids. Mr. Besant, the Director of the Botanic Gardens, informs me that the cultivation of belladonna and aconite presents no difficulty.

Peppermint and Lavender.—I understand that experiments are being conducted at University College, Cork, in connection with the cultivation of peppermint and lavender.

Cascara Sagrada.—This is being tried by our Forestry Department, but it is yet too early to give result.

Dandelion, Couch Grass, Broom, Irish Moss (*Carragheen*), *Hemlock* are all so freely and widely distributed that their collection presents no difficulty. They or their preparations are all imported, not excluding Irish moss.

Raw Materials

Ireland is not an industrial country, yet much of the raw material necessary for the manufacture of pharmaceutical products is available.

Alcohol.—This is perhaps the most important material from the manufacturers' point of view. One firm supplies an immature spirit about 66 degrees over proof. Industrial and methylated spirit are manufactured in Dublin.

Honey and Beeswax—both of excellent quality and suitable in every way for pharmaceutical preparations—are produced commercially.

Lard.—Irish lard has a good reputation. Being a perfectly pure product, it meets the requirements of the Pharmacopœia in all particulars. It is much superior to the imported American lard.

Glycerin is produced in connection with the soap industry, but it is not sufficiently purified for Pharmaceutical use.

Liquid Paraffin, B.P., is produced in Dublin from crude Russian petroleum. The same firm also produce a white and a yellow soft paraffin.

Sugar is manufactured at Carlow under subsidy. A sample examined showed 99.9 per cent. purity by polarimetry, and in other respects was up to the B.P. standard.

DISCUSSION

The CHAIRMAN expressed the satisfaction of members at having papers of this nature in the transactions.

Mr. ROWLAND complained that the Irish lard was generally too stiff.

Mr. BREWIS said the paper was interesting to him personally, as when an apprentice in Dublin he had spent many hours in making extract of henbane and extract of belladonna from plants collected locally. Judging by the abundance referred to by Mr. Sargent, Mr. Brewis thought the collection of male fern might be profitably undertaken provided the wages of the "agricultural artisan" were not too exorbitant. At present we are practically dependent on Switzerland and Sweden. Collection in Britain was almost impossible, owing to the cost. He considered male fern could be exported from Ireland, as the quantities used are very large. Regarding cascara, that was looking a long way into the future—first the years while the trees are growing, and afterwards maturing the bark for three years. He inquired if it were not possible to make Irish lard in large quantities and so reduce the overhead charges. Irish lard is excellent for ointments sent to countries with tropical climates. As far back as 1884 it was known that sugar beet grown at Glasnevin and in Waterford was quite as good as that from Germany, but it was impossible to compete in price owing to the bounty of 2s. 6d. per cwt. granted by the Government of that country. The industry had thus been held up, and the position was accentuated by the free trade policy of the home Government of that day. Mr. Brewis asked if the author had definitely identified the aconite root as that of *A. Napellus.*

Mr. STOREY inquired if the cultivated digitalis would yield the same percentage of alkaloids as that grown wild. As regards tincture of digitalis the analyst decides its value on extractive matter and ignores the physiological action. With reference to lard, Mr. Storey said his firm had had no complaints regarding it. He had noticed that seaweed was being gathered along the coast to make kelp. This was an industry which had practically died out, and he was glad to see it reviving.

Mr. FOURACRE suggested that for assessing the value of digitalis preparations a co-ordination of physical and chemical tests might prove satisfactory, but he inquired if anyone had any experience of the use of the ultra-violet rays lamp for this purpose. He thought this method had great possibilities in assaying digitalis.

Mr. J. GRIER pointed out that digitalis contained two active principles, one of which was water soluble and the other was not. It was possible to grow digitalis leaves containing varying amounts of these and he thought that medical men should be provided with preparations containing each exclusively.

Mr. WALMSLEY said this paper opened up great possibilities for Ireland, but he pointed out that collectors often exterminate plants, and to prevent such an occurrence he suggested that adequate safeguards should be undertaken. Referring to male fern, he considered tests should be on pure filicic acid. As regards digitalis, the analysts used to take the total solids, but they now rely on biological methods.

Mr. STOREY pointed out that it is the analyst who lays down standards.

Mr. SARGENT, in reply, said he was glad to hear that Irish lard has such a good reputation; the price was high probably owing to its extensive use for edible purposes. Beet sugar is not at present a commercial success, but is subsidised. He had collected the digitalis leaves himself, and could guarantee that each leaf was second-year growth, and it was not always possible to say this in the case of bought ones. He understood that cultivated digitalis is not so active as in the wild, and he had no knowledge of the ultra-violet assay method. Tinctures tested by physiological standards would be a useful guide for analysts. The aconite was identified as *A. Napellus.* The kelp industry is a dead letter, and the dried seaweed seen round the coast is probably for use as a fertiliser.

The next paper (read by Mr. Eastland) dealt with :—

Some Observations on the Antimony Trichloride Colour Test for Vitamin A

By NORMAN EVERS

[ABSTRACT]

THE well-known antimony trichloride colour test for vitamin A was first suggested by Carr and Price. Evidence has accumulated to show that the test is specific. Some even go as far as to say that its accuracy, as an indication of the amount of vitamin A present, is more to be trusted than the methods of biological assay. A series of comparisons between the biological and colorimetric methods for a number of oils was recently given, and this includes some disquieting figures. Whereas the biological assays are all within the limits reasonably to be expected for cod-liver oils, the colorimetric result in

BRITISH PHARMACEUTICAL CONFERENCE 1929

some cases exceeded the biological assay by from 20 to 600 per cent. Colorimetric values were obtained equivalent to as high as 4475 U.S.P. biological units per gm. Such high values are entirely outside the author's experience of the values given by pure cod-liver oils of various origins, but he is inclined to the conclusion that the source, age, manner of production and storage are among the factors which influence the extent to which the colour is indicative of vitamin-A potency. It has been stated that fresh Norwegian cod-liver oil, after exposure outdoors, gives a deeper blue colour with antimony trichloride than a control sample kept indoors in the dark. The conditions for carrying out the test originally laid down by Carr and Price have been studied by a number of other research workers. In the experience of the author, recrystallisation of the antimony trichloride tends to give lower colour values. Table I. shows the results obtained with several reagents of different ages and sources.

Oil	Date	Vitamin A, units per gram				
		Reagent				
		RA	RB	A	B	C
Cod-liver oil, No. 1	8.4.29	1,200	1,200	—	—	—
Cod-liver oil, No. 2	17.4.29	990	—	1,100	—	—
Cod-liver oil, No. 3	17.4.29	860	—	990	—	—
Cod-liver oil, No. 4	17.4.29	1,032	—	1,290	—	—
Cod-liver oil, No. 5	10.4.29	390	390	550	510	—
,, ,, ,,	26.4.29	370	360	400	—	404
,, ,, ,,	9.5.29	370	380	460	460	410
Cod-liver oil, No. 6	17.4.29	990	—	1,130	—	—
Cod-liver oil, No. 7	17.4.29	920	960	1,150	—	1,010
,, ,,	26.4.29	840	860	930	—	880
Cod-liver oil, No. 8	8.4.29	890	890	1,100	1,120	—
,, ,,	2.5.29	930	910	1,070	—	940
Cod-liver oil, No. 9	9.5.29	640	620	690	690	650
Liver fat	17.4.29	16,500	16,500	16,850	—	—
,, ,, ...	23.4.29	17,200	—	—	—	—
,, ,, ...	26.4.29	17,000	—	18,600	—	—

RA was made (8.4.29) by recrystallising antimony trichloride from anhydrous chloroform and dissolving in the same solvent. RB was made in the same way at the same time from antimony trichloride from a different source. A was made about two months previously from antimony trichloride, which had been washed with chloroform, but not recrystallised B was made a month previously to RA and RB in the same way as A. C was made without recrystallisation from the same material as R.A.

These results show that the two reagents prepared from recrystallised antimony trichloride give definitely lower figures than the two older reagents, but only slightly lower than C made from the same material without recrystallisation. The old reagents A and B had been kept chiefly in the dark. Are the higher figures to be attributed to the production of phosgene during ageing? Against this assumption, neither RA nor RB shows any indication of giving higher results after having been made for a month, unless it be supposed that all the oils are losing vitamin A, which is not likely to be the case with cod-liver oil No. 5, which was stored in large bulk and carefully protected against light or oxidation. On the whole the results obtained with RA and RB appear to be more consistent than those with A, and those with RA and RB agree very well. It appears that, although the results are lower, it is advisable to use a reagent made from recrystallised antimony trichloride and not more than a month old.

Effect of Quantity Taken for the Test

It has previously been shown that the reading obtained is not proportional to the concentration of oil in the reaction mixture, nor is the curve obtained by plotting the concentration of oil in the reaction mixture against the tintometer readings a straight line. That this factor may be a serious source of error in the application of the test is shown. By varying the percentage of cod-liver oil in the reaction mixture from 0.7 to 4.0 per cent. results for the units per gram of vitamin A vary from 1380 to 1030. This effect is even more striking with liver fat than with cod-liver oil. The results obtained from these samples of liver fat in the same way are shown graphically. The curve obtained with liver fat B is remarkably steep, and by using a concentration of 0.02 per cent. instead of 0.10 per cent. the apparent vitamin A content is more than doubled. The curve in a third graph was obtained with an ox-liver fat cencentrate of extremely high activity. Even using such a small concentration as 0.00025 per cent., *i.e.*, an actual weight of 0.005 mg. of fat, for the test, there is still no sign of any flattening of the curve. It was observed with this ox-liver fat that as little as 0.0005 mg. gave a distinct colour with the test. Since there are limits to the amounts of colour that can be read accurately in the tintometer it follows that a true quantitative comparison between oils of varying activity, such as between cod-liver oil and liver fat, is impossible. Under the circumstances the best method of comparison appears to be to compare the amounts of oil which give the same reading under the conditions of the test in a cell of given thickness in the tintometer. The author finds that using a 1 cm. cell a reading of between 4 and 6 blue units can be read most accurately, the results rarely differing by more than 0.1 unit. In a paper published at last year's Conference the factor 85 was suggested for the conversion of blue tintometer units read in a 1 cm. cell under the ordinary conditions of the test into units per gram corresponding approximately with the U.S.P. biological units. This factor has been adopted in the results recorded in the present paper. The ordinary conditions of the test are as follows :— 2 c.c. of oil are pipetted into a tube or flask and the volume made up to 10 c.c. with dry chloroform. 0.2 c.c. of this solution is pipetted into a test tube. 2 c.c. of antimony trichloride reagent are added, with thorough mixing, a stop-watch being started when the last drop of reagent is added. The mixture is quickly transferred to a 1 cm. cell and the reading of the colour is taken at thirty seconds. The number of blue units multiplied by 85 gives units per gram of vitamin A. If the colour reading is less than 4 or more than 6 blue units the test is repeated using a larger or smaller quantity of oil accordingly, so that the reading lies between 4 and 6 blue units, and the result is multiplied by the necessary factor to give unit per gram.

Addition of a Neutral Oil

The addition of a neutral oil so that the total concentration of oil was constant while the concentration of ox-liver fat varied was tried. Arachis oil was used, and the results are shown graphically. The arachis oil alone gave no measurable colour within the thirty seconds required to take the reading. The effect of the addition of neutral oil is to flatten the curve considerably and make the readings more uniform though lower throughout. Another graph shows the effect of the addition of 0.5 per cent. of ox-liver fat which had been irradiated sufficiently to destroy the vitamin A completely contrasted with the addition of 2 per cent. of arachis oil. Evidently the addition of irradiated ox-liver fat has the same effect as the addition of a neutral oil.

When a soution of ox-liver fat in chloroform is allowed to stand in the dark the colour of the solution slowly fades, while the vitamin A, as measured by the colour test, is comparatively unaffected. It was found that the reduction in colour was also accompanied by a flattening of the colour-concentration of oil curve in the same way as the addition of neutral oil. The suggestion is that the natural colour of the ox-liver fat in some way affects the production of the colour with antimony trichloride, though in what way is not clear, since there is no permanent blue colour formed by ox-liver fat with antimony chloride, as there is with carotene-containing fats.

Summary

(1) The varying results obtained with different lots of reagent are shown, and the conclusion is drawn that,

BRITISH PHARMACEUTICAL CONFERENCE 1929

though lower results are obtained, it is safer to recrystallise the antimony trichloride, and to use the reagent not more than a month old.

(2) It is shown that the quantity of oil taken for the test has a very marked effect on the results obtained, particularly with highly active fats such as ox-liver fat.

(3) The error due to this cause may be minimised by the addition of an inactive oil, such as arachis oil, so that the total concentration of oil in the reaction mixture is about 2 per cent.

(4) The presence of the natural colouring matter of ox-liver fat has some influence on the relation of the colours obtained from two different quantities of fat.

The paper is illustrated by six charts. The work was carried out in the laboratories of Messrs. Allen & Hanburys, Ltd.

Discussion

The CHAIRMAN said that this was an important paper, and read a note by Mr. T. T. Cocking, F.I.C., on the subject, which stated that the reason that Mr. Evers's results showed variations according to the amount of oil present in the reaction mixture was no doubt due to a secondary reaction of the reagent on the oil itself, causing more rapid fading of the colour. In his experience the amount of oil within reasonable limits did not affect the depth of blue colour produced. The routine examination of a large number of vitamin A concentrates and products obtained by diluting these with oil gave results which showed an average error of only 2 per cent. Many of these concentrates were diluted fifteen times, and yet the results after diluting agreed with the calculated figures, thus showing that under conditions of the test concordant results were obtained, even when the amount of oil in the test was fifteen times that in the other. As originally carried out by Carr and Price, the maximum blue colour was determined. The time required to develop the maximum colour varied considerably with the different oils, and there was no doubt that temperature also had some effect. Not only did the time of development vary, but also the time of fading, hence the maximum colour was the only true guide to the vitamin content. The colour after thirty seconds might or might not coincide with the maximum. The author's figures would have been more useful if they had been expressed as "blue" figures in accordance with the original method. The maturing of the blue colour produced by 0.2 c.c. of a 20 per cent. solution of cod-liver oil and 2 c.c. of the antimony chloride reagent in a cell 8 mm. across against Lovibond's standard coloured glasses was first suggested by the originators of this test, who stated their results in Lovibond's units. Most other workers had adopted these conditions for their standard test, and their published results had been expressed accordingly. Mr. Evers used a 1 cm. cell, and, consequently, his blue figures were not comparable with those for an 8 mm. cell, as it was well known that the colours were not directly proportional to the thickness of the liquid. Again, the results had been nullified by a factor called "U.S.P. units." The "U.S.P. units" were for the feeding test, and altering a factor might be useful for comparing results by both methods, yet the term "U.S.P. units" should be confined solely to the feeding test. Mr. Cocking had found that the antimony chloride reagent as originally prepared kept perfectly well in an ordinary green glass-stoppered bottle in the laboratory. Results had shown no appreciable difference, whether freshly made or old reagent was used.

The next paper was again read by Mr. Eastland. The subject dealt with was :—

The Volumetric Determination of Phosphoric Acid

By WILFRED SMITH, B.Sc., A.I.C.

[ABSTRACT]

FOR accurate phosphate determinations, the well-known gravimetric method of precipitation as magnesium ammonium phosphate is undoubtedly the most reliable, but as this is a somewhat lengthy procedure, its value for ordinary analytical work is somewhat diminished. Several methods of indirect volumetric titrations have been employed. That of the U.S.P. is the commonest. This consists of neutralising a weighed amount of acid with chlorine-free caustic soda to phenolphthalein, adding excess of standard silver nitrate while shaking. The mixture is neutralised to litmus with chlorine-free zinc oxide. The direct methods of titration are more numerous. Lizius and Evers obtained accurate results for the titration of phosphoric acid to an acid phosphate by using as indicator bromphenol blue when coming from the acid side, or methyl red when coming from the alkaline side, and titrating to a maximum blue and maximum red colour respectively. Titrations requiring to be continued to a maximum colour are not very satisfactory, as they involve too large a personal factor. The authors found thymol blue the best indicator for titration to the disodium monoacid salt, and showed that, when phenolphthalein was used in a 0.2-per-cent. solution, the amount of indicator added seriously affected the result of the titration. Of likely indicators the following table gives the PH range :—

Dimethylaminoazobenzene	2.9 — 4.0
Methyl orange	3.1 — 4.4
Cresolphthalein	8.2 — 9.8
Phenolphthalein	8.3 — 10.0
Thymolphthalein	9.3 — 10.5

Starting with pure phosphoric acid and titrating with caustic soda, either of the first two indicators should show the reaction—

$$H_3PO_4 + NaOH \longrightarrow NaH_2PO_4 + H_2O,$$

while any of the last three should show the reaction—

$$NaH_2PO_4 + NaOH \longrightarrow Na_2HPO_4 + H_2O.$$

A solution of phosphoric acid was made up, on which a gravimetric determination gave 2.142 per cent. Experiments were tried, using dimethylaminoazobenzene (referred to as "azo") and methyl orange, both with and without the addition of salt solution. "Azo," if taken to the first bright yellow colour, gave a better end-point than was given by methyl orange, and the addition of salt did not affect the result of the titration appreciably. The second hydrogen displacement was then tried, using the last three indicators in the table alone, and with the addition of salt, and the temperature of the titration was varied. Thymolphthalein in presence of salt was useless, and without salt only a fair result was obtained. Phenolphthalein was useless alone, but after the addition of salt a very good end-point was given, while cresolphthalein alone gave a similar result to that obtained with phenolphthalein and salt. The second end-point was therefore shown by cresolphthalein, while Shireman's method was used for the third displacement, using cresolphthalein instead of phenolphthalein. That is, after using cresolphthalein as the indicator for the second titration, calcium chloride solution, previously neutralised with hydrochloric acid to cresolphthalein, was added, the liquid heated to 70° C., and the titration completed. Thus, using 10 gm. of the phosphoric acid solution prepared, and using $N/5$ sodium hydroxide for the titration :—

Titration	*Difference*
1. "Azo" indicator = 10.95 c.c. $N/5$ NaOH	
2. Cresolphthalein indicator = 21.95 c.c. $N/5$ NaOH	11.0 c.c.
3. Cresolphthalein with $CaCl_2$ at 70° C. = 32.95 c.c. $N/5$ NaOH = 2.152 per cent. phosphoric acid.	11.0 c.c.

From the foregoing results the following method was obtained :—

One gram of 20-per-cent. phosphoric acid solution, or the equivalent of a solution of different strength, is weighed out and transferred to an Erlenmeyer flask. Two drops of a 0.04-per-cent. solution of dimethylaminoazobenzene in 90-per-cent. s.v.m. are added, and the acid titrated with $N/5$ sodium hydroxide solution until the colour changes from red through dull orange to a bright yellow. This is the end of the reaction to NaH_2PO_4.

BRITISH PHARMACEUTICAL CONFERENCE 1929

To the same solution a few drops of a 0.04-per-cent. solution of cresolphthalein in 60-per-cent. alcohol are added, and the titration continued with $N/5$ sodium hydroxide until a pink colour is obtained. This is the end of the reaction to Na_2HPO_4. This titration figure should be twice the previous titration figure. To the same solution add a solution of 5 gm. of calcium chloride in water, neutral to cresolphthalein, and heat to 70° C. and continue the titration with $N/5$ sodium hydroxide. The colour of the indicator fades quickly, and the first appearance of pink colour should be taken as the end of the reaction. The titration figure should be three times as great as the first titration figure. A few experiments were tried where extraneous substances were added to the phosphoric acid solution and their effect on the titration values observed. Strong acids, such as sulphuric and hydrochloric acids, were included in the first titration value to "azo" indicator. Calcium present did not affect the first figure, but increased the second titration figure.

Summary

A method is given, with which, by using two indicators, the direct titration of phosphoric acid may be accomplished. Dimethylaminoazobenzene is used for the first titration, cresolphthalein for the second, and cresolphthalein with calcium chloride at 70° C. for the third. The author expresses his thanks to Allen & Hanburys, Ltd., to Mr. Norman Evers, and to Mr. L. A. Haddock.

Discussion

The Chairman said the author had tackled a difficult subject, but had apparently made no reference to mixed indicators. Calcium chloride for titration is somewhat unreliable, due to the calcium phosphate precipitate being slightly soluble.

Mr. Jones said that in titrating it was wise to endeavour to estimate the three hydrogens, but, on the whole, to trust to the middle one. He does not quite agree that phenolphthalein is useless. It is not for analysts to take a method as published, but to satisfy themselves that the process in their hands gives proper results.

Mr. Walmsley remarked that the determination of phosphoric acid by the B.P. method is a stumbling-block.

Mr. Eastland said the end-point was made clearer by the calcium phosphate in the third stage, as it acts as a background.

The next paper was :—

A Note on Extract of Gentian

By H. Davies

[Abstract]

The object of the following paper is to emphasise the non-uniformity of the soft extracts prepared in accordance with the official directions. Particular stress is laid on the inadequacy of the words "evaporate the liquid to a soft extract." The word "soft" allows of a too flexible interpretation. An examination of various samples of extract of gentian obtained from various wholesale houses has confirmed this. Five samples were obtained, and the difference between the extremes was most marked—the one being a limpid fluid, easily pourable, the other being almost solid. Determinations of moisture were made in the following manner :—0.5 gm. of the extract was dissolved by the aid of heat in 5 c.c. of water, in a tared flat-bottomed glass dish, evaporated on a water bath and dried to constant weight at 102° C. Larger quantities involve tedious drying to obtain concordant results. The following figures were obtained :—

Moisture in gm. per 100 gm. of Extract

1	2	3	4	5
23.52	21.00	20.22	18.59	16.03

Approximate determinations of the viscosity were made by a modification of the "falling shot method." The results placed them in the following order :—2, 3, 5, 1, 4, sample 2 having the lowest and 4 the greatest value. Evidently viscosity was not a function of the moisture content alone. The writer suggests it may be due to different temperatures of evaporation or to variable qualities of gentian.

Conclusion

The author suggests that, should soft extracts be retained in the Pharmacopœia :—(1) A limit of moisture of 20 per cent. be allowed. (2) The determination of the moisture content be made as above. (3) Soft extracts such as extractum colchici be standardised on alkaloidal content in view of moisture.

There was no discussion.

The next paper, read by Mr. D. Lloyd Howard, was :—

The Gravimetric Electrodeposition of Metals and its Application to Pharmaceutical Chemicals

By S. Gordon Liversedge

[Abstract]

It is a quarter of a century since H. J. S. Sand published his improvements in the electrodeposition of metals, and showed conclusively that by means of platinum gauze electrodes, one of which rotated, it was possible to determine quantitatively the amount of metals in solution with great accuracy in a surprisingly short period—usually fifteen minutes suffices for deposition. This electrochemical method appears to have been overlooked by the pharmacopœias of the world, with the exception of the United States Pharmacopœia, which devotes a chapter to the subject and gives details for copper, mercury and zinc salts.

Mercury

The U.S.P.X. applies the electrochemical method to hydrarg. ammon., calomel, hydrarg. perchlor., hydrarg. iod., and hydrarg. salicylas, and states : "The sample (0.5—1.0 gm.) is accurately weighed into a cathode cup and 10 c.c. sodium sulphide solution (50 per cent.) added and completely dissolved by agitation. Dilute the mixture to 30 c.c. and pass 2—3 amperes at 7—10 volts for half-an-hour (or until a few drops of the liquid give no black precipitate or colouration with NH_4Cl solution. Revolutions 500 per min.)"

Another method which is accurate, but takes about fifteen hours, is the electrolysis of a solution containing mercury with potassium cyanide forming the complex $K_2Hg(CN)_4$. The current used was 0.3 to 1 ampere only. The author has successfully employed the double iodide of mercury and potassium $HgI_2 2KI$, instead of the above electrotytes. All the mercury was deposited within ten minutes as a lustrous adherent coating, under stated conditions. It is essential to alkalise with soda before electrolysis, otherwise free iodine is simultaneously liberated at the anode. On account of the extreme volatility of mercury it was important to ensure effective and rapid drying of the deposit without loss. After being water-washed the cathode, with Hg deposit, is completely immersed in dry alcohol, followed by immersion in dry ether, these operations being repeated. The ether is evaporated by a current of dry air at ordinary temperature for a minute. After standing in a desiccator or in the balance case for five minutes it is weighed. To test this method the gauze electrode was immersed in water, dried by this method, and found to give a constant weight. As a matter of interest, a gauze platinum cathode left in a cupboard for two days at the ordinary temperature was found to lose 10 milligrams, and after three days 13 milligrams. The following procedure is suggested :—The weighed quantity of sample is dissolved in water or acid as required, and sufficient iodide of potash added to form a clear solution of the double salt. After making strongly alkaline with soda, dilute the liquid to about 80 c.c.

BRITISH PHARMACEUTICAL CONFERENCE 1929

Start rotation of anode and heat the solution to about 80° C., or even to boiling point, before electrolysis. The solution should give no qualitative reaction for mercury after fifteen minutes at the most. It is advisable in all cases to reduce to 3 amperes towards the close. Moderate agitation in the air does not detach the mercury. In the case of hydrarg. cum creta there are two ways in which the mercury can rapidly be estimated:—(1) The nitric acid method, and (2) the double-iodide method. In the first method it is necessary to dissolve the quantity of hydrarg. cum creta in dilute nitric acid and oxides of nitrogen must be removed by the addition of urea or by evaporation. The presence of double the quantity of calcium carbonate does not vitiate the results. Dried with alcohol, ether and air as described, the deposit obtained was particularly lustrous and adherent. In estimating hydrarg cum creta by the double iodide method the lime must first be removed and the following procedure was adopted:—The weighed quantity of hydrarg. cum creta (about 1 gm.) is carefully dissolved in a little nitric acid, after which KI is added, followed by a little sodium acetate and sufficient sodium oxalate. After heating the CaC_2O_4 is quickly filtered through a Gooch crucible, washed with water and alkalised with NaOH. It must be re-filtered if not free from precipitate and is then ready for electrolysis. Several attempts were made to avoid removal of the lime, but were not successful. If ammonia be used instead of soda, crystals of nitrogen iodide separate on the inside of the anode, and on one occasion when attempting to remove a deposit of the iodide with hydrazine sulphate an explosion occurred.

Bismuth

Sand shows that bismuth may be deposited quantitatively in nine minutes from its solution providing the potential of the anode is kept as low as possible. The author dispensed with the auxiliary electrode to control the potential of the cathode; a sample of bismuth sodium tartrate was used for this purpose. Unsuitable conditions (such as temperature and current) cause formation of a spongy non-adherent deposit of bismuth readily removed by washing. Eventually the following method was adopted. From 0.5 gm. to 1.0 gm. bismuth sodium tartrate was dissolved in water, 2½ c.c. concentrated nitric acid added, and the solution heated to about 70° C. and maintained at that temperature. A low current density of two amperes was used which was gradually reduced towards the end to approximately zero. After ten minutes a portion of the solution gave no colouration with hydrogen sulphide water. The deposit was excellent and quickly dried by means of alcohol, ether and warm air. Chemical analysis by sulphide method indicated forty-eight per cent. Bi_2O_3.

Antimony

It has been stated that both sodium and ammonium sulphoantimonate or sulpho-antimonite may be used with a current of 1 to 1½ ampere at 65° C., but the time taken is as long as ninety minutes. The formation of polysulphides had to be obviated by the use of cyanide of potash and altogether antimony seems to have been a troublesome proposition. Excellent results in less than a quarter of the time had, however, been obtained by keeping the temperature high, thus preventing the formation of stibine which tends to produce spongy deposits. In the present experiments the antimony content of tartar emetic was determined by electrolysis. In the first instance it was dissolved in water, tartaric acid and sulphate of potash being added, but owing to the production of much solid acid potass. tartrate on the cathode, potassium sulphate had to be replaced by sodium sulphate. This resulted in partial deposition only and a depolariser and reducing agent in the form of hydrazine sulphate was found to be necessary. The method which gave a satisfactory result was as follows:—From 0.5 to 1.0 gm. tartar emetic was dissolved in just sufficient water, 3 gm. (approximately) tartaric acid and 2 gm. Na_2SO_4 added, followed by ½ gm. hydrazine sulphate. After dilution to 80 c.c. this was heated to about 80° C. Rotation of the anode was kept at 500 revs. per min. and the current at 3 amperes for fifteen minutes under which conditions all antimony was found to be absent from the solution. The cathode and deposit was dried with alcohol, ether and warm air. It was hoped that the above method would be suitable for the estimation of antimony in antimonious oxide B.P., but owing to the presence of some quinquevalent antimony, the whole of the metal was not removed from solution. One experiment yielded 95.9 per cent. Sb_2O_3, and further experiments are in progress to find a satisfactory method of determination. Commercial samples of antimony oxide were found to yield lower figures than the limit given in the B.P., 1914, when the B.P. method is used.

Other Metals

The U.S.P.X. gives details for the electro-analysis of the carbonate, chloride, oxide, sulphate and phenolsulphonate of zinc. The electro-chemical method for zinc detailed by Sand gave excellent results, agreeing very closely with those obtained by the zinc ammonium phosphate method. A sample of argenti nitras was examined by the electrometric method and proved much more convenient and accurate than that given in the Pharmacopœia. The principal condition to observe is the maintenance of a high temperature since silver peroxide is thereby prevented from forming on the anode. A much higher potential (eight to ten amperes) is necessary, if the double cyanide method is used, and the deposit may be obtained within six minutes. The electrolytic method for copper is too well known to require more than a reference, and the same may be said of lead. With the advent of cheap electricity and improved methods, it seems reasonable to predict the general use of electrometric analysis in the near future. Throughout the paper results obtained are tabulated.

Discussion

The Chairman said that this was the author's first contribution to the Conference and was a useful summary of an important subject. There was no doubt that electrodeposition methods saved time in a laboratory, provided that there was sufficient work to keep the apparatus in use. He would like to know whether the author had carried out determinations on minute traces, for example—parts per million—of lead and copper.

Dr. Hampshire read a note from the author in which he referred to the estimation of mercury in some preparations: "The electrolysis of the double iodide is particularly well suited for the analysis of tab. hydrarg. iodid. c. pot. iodid., and after addition of excess potass. iodid, and alkalising, to liq. hydrarg. perchlor. in the same way. The electrolytic method was tried on calomel tablets, but it was found that the starch or other excipient prevented the deposition of the mercury quantitatively. The solution became quite thick with separated suspended fluid."

The remaining papers dealt with at the morning session were those by Mr. Alan H. Ware, Ph.C., as follows:—

The Use of Aldehydes and Dihydroxy-Acetone in the Detection and Differentiation of Phenols

I.—Colour Reactions Given in Sulphuric Acid Solution

By Alan H. Ware

[Abstracts]

If not obtainable otherwise, dihydroxy-acetone can be purchased under a proprietary name, or it may be made in the form of a solution, suitable for use as a reagent, by the method in which glycerin is oxidised with bromine water. The solution obtained by this method gives results which differ somewhat from those given by the solution recommended by the present writer, but it could be used in specific instances if comparison were made with authentic specimens of the phenols suspected of being present in bodies under examination. The

BRITISH PHARMACEUTICAL CONFERENCE 1929

following method was found to give the greatest amount of differentiation. Solutions (aqueous) are prepared containing respectively 10 per cent. of dihydroxy-acetone and 5 per cent. of hydrobromic acid; 0.05 gm. or less of the phenol is dissolved in 2.5 to 3 c.c. of concentrated sulphuric acid. One drop of the oxantin solution is then added to the mixture (now contained in a test-tube) and any change of colour observed. From one to six drops of the 5-per-cent. hydrobromic acid are then added drop by drop, shaking between each addition, less than six drops being used if the maximum of distinctive colour-change or intensification be reached with less. Lastly, water is added drop by drop until either a precipitate appears or distinctive colour-change ceases. The method adopted with tartaric acid was that commonly described in the text-books, but new results are recorded. In order to obtain really satisfactory results in all the possible cases certain precautions are essential. From 0.1 to 0.5 gm. of the phenol is dissolved in 5 c.c. of concentrated sulphuric acid, moisture being avoided. An amount of tartaric acid not larger than a small pin's head is next added. The mixture is then transferred to a dry test-tube and heated very gradually over (not actually in) the Bunsen flame. If necessary the heating is continued until irritating fumes appear, because in some cases the characteristic colours do not appear until just before this happens. The greatest amount of differentiation when employing formaldehyde was yielded by the following method: 1 c.c. of commercial formalin (40 per cent.) or of B.P. solution of formaldehyde is mixed with sufficient concentrated sulphuric acid to make 100 c.c.; 2.5 c.c. of this reagent is mixed with an equal volume of a solution of the phenol (0.01 to 0.05 gm.) in concentrated sulphuric acid. The colour is then noted and afterwards water is added, drop by drop, shaking between each addition, until either a precipitate appears or no further characteristic change occurs. If a dark precipitate is given the mixture is added slowly to 5—6 c.c. of industrial alcohol in such a manner that any green-coloured solution given is observed before too much is added. An elaborate table showing the results given by individual phenols to each of these three methods is provided by the author.

It is concluded that by the use of these three reagents of the aldehyde or ketone class, viz., dihydroxy-acetone tartaric acid and formaldehyde in concentrated sulphuric acid solution, a great deal of differentiation between phenols may be obtained, if appropriate methods are employed. A test carried out in strong sulphuric acid admixture is more generally applicable to pure substances than to mixtures, but these tests can be quite often applied in the latter case by shaking out the crude phenol with ether or other suitable solvent and applying the test to the residue left after evaporating off the solvent. In many cases, however, the methods in which hydrochloric acid is used are more appropriately applied to mixtures. Attention is especially called to the particularly distinctive results yielded by the naphthols, morphine, codeine, apomorphine, diacetylmorphine, phloridzin, the catechinols, orcinol, resorcinol, phloroglucinol, guaiacol carbonate, pyrogallol, gallic acid and gallotannin (although with respect to gallic acid it should be remembered that it may yield a purple or violet colour-reaction if heated with sulphuric acid alone). No claim for originality is made with respect to the use of these reagents, and many of the results obtained were previously well known, but a much greater number of results have been recorded than were previously known, and in two cases these have partly been obtained by the use of new and more effective methods of applying the reagents.

II.—Precipitation and Standing Tests Involving the Use of Hydrochloric Acid

Most phenols, including complex plant phenols, can be precipitated by formaldehyde from aqueous solutions containing sufficient hydrochloric acid. The fact of precipitation or non-precipitation, as the case may be, the speed of precipitation, the colour of the precipitate, and its solubilities in alcohol or aqueous alkali are dependent, more particularly, on the following factors: (*a*) The nature of the phenol; (*b*) the strength (or hydrogen-ion concentration) of the aqueous acid; (*c*) the temperature to which the mixture is subjected; (*d*) the length of time allowed for the carrying out of the experiment under the particular conditions which result in precipitation. Successive tests were made by dissolving one drop of liquefied carbolic acid and five drops of aqueous formaldehyde (38 per cent.) in 10 c.c. of aqueous hydrochloric acid of strengths 2.5*N*, 5*N* and 7.5*N*. In each case the same test tube (about $\frac{3}{4}$ in. diameter) was used. Comparisons were made by carrying out successive experiments at the atmospheric temperature and at the temperature given by immersing the tube in a boiling water bath. The following results were obtained at the ordinary atmospheric temperature: The mixture in 2.5*N* HCl did not precipitate in thirty minutes. The admixture in 5*N* HCl became turbid in twenty minutes. The admixture in 7.5*N* HCl became markedly turbid in two minutes. At the temperature of the boiling water bath the results were as follows: In 2.5*N* HCl precipiation commenced after ninety seconds, but the precipitate only became pink after prolonged boiling, and then was still soluble in alcohol or 5 per cent. aqueous potash. In 5*N* HCl the precipitate began to form in fifteen seconds and became definitely pink in one minute. After two minutes it was almost insoluble in alcohol or aqueous potash. In 7.5*N* HCl a markedly pink precipitate was given in five seconds and within a period of two minutes this was found to be insoluble in the solvents named. The possibilities of using this formaldehyde reaction for the purpose of bringing about the qualitative separation of phenols was first suggested to the writer as the result of experiments conducted by him in 1924, which led to the publication of his modification of Stiasny's test with formaldehyde for phlobotannins. An experiment in which gambier was used is given as an example of the differentiating power of the test. The distinctive separation obtained illustrates a method of applying the test which in its essentials can often be used to furnish valuable results, but supplementary details are necessary in order to meet the case of a mixture of phenols. General methods of testing are set out, and the results are tabulated.

Tests which are similar to those described may be carried out by substituting dihydroxy-acetone for formaldehyde. In order to get the most distinctive results with this reagent it is necessary to use the hydrochloric acid in a concentration of not less than 7.5*N*. Partly for this reason dihydroxy-acetone is not so useful a reagent as formaldehyde for effecting the separation of phenols, but it yields a number of exceptionally specific results with certain phenols, which are useful in the identification of such of these as are not so readily distinguished by the formaldehyde method. Details of the test and particulars of the results obtained are given.

A limited number of phenols give condensation products with certain aldehydes or ketones which possess considerable tinctorial powers. Tests in which a filter paper is used as the material to be stained are described for the first time. In this method two circular filter papers (diam. 11—13 cm.) are laid one on the other, so as to coincide, upon a tile. Two or three drops of a solution of the phenol (made preferably about 0.01 gm. in 1 c.c. of alcohol) containing also one drop of formaldehyde or a small pinch of dihydroxy-acetone are then allowed to fall upon the middle of the upper of these papers. When the papers are no longer wet but still moist, four to six drops of concentrated hydrochloric acid are added in the same way. The papers are now warmed until half-dried and any colour produced is noted. Next, one drop of 10 vol. hydrogen peroxide and two further drops of the strong acid are added, in each case to the middle of the paper, and the warming process repeated, and any further colour change noted. Lastly, the papers being once again on the

BRITISH PHARMACEUTICAL CONFERENCE 1929

tile, a sufficient quantity of aqueous solution of ammonia is dropped on to the paper.

These two methods have the advantage over similar tests conducted in a test-tube that they distinguish certain phenols from others which may give similar results in a test-tube but possess less tinctorial power and so do not effectively stain up the lignin of the wood or the cellulose of the paper. In other cases the positive results given on the paper are quite different from those given in a test tube. Further, the method possesses the great advantage when material is short that very little of it is used in the test. Details of the results given to all three of the reagents named in this paper are also tabulated.

III.—Note on the Detection of Cresol in Carbolic Acid by Means of Vanillin

In a previous paper two years ago the writer showed that the test with glycerin, used in the British Pharmacopœia, for the detection of carbolic acid in cresol was useless, and he described a much better method for the detection of this adulterant. The Pharmacopœia also uses a somewhat similar method, but in the converse way, for the detection of cresol in carbolic acid. This test is of more value than the one first referred to, but experiments conducted at various times during the past three years, using different samples of cresol each time for admixture with the carbolic acid, showed that the test could not safely be relied upon to detect less than 7.5 per cent. of cresol, although with some samples of cresol as little as 5 per cent. could be detected. The following test, in which vanillin is used, has been found to be a much better method for detecting the presence of cresol in carbolic acid :—

If the carbolic acid is crystalline liquefy it by the addition of sufficient water. Cool thoroughly before using. The reagent is next prepared by adding two drops of a 2-per-cent. solution of vanillin in alcohol to 5 c.c. of concentrated hydrochloric acid. Cool. Now add five drops of the phenol to this admixture drop by drop and shake well. When the phenol has crystallised out of the admixture, add to the latter, if necessary, another five drops of the liquefied phenol and again shake. If no cresol be present, not more than a faint salmon-pink colour will be given to the crystals or liquid after standing for from two to four minutes, but if as little as 1.5 per cent. of cresol be present a definite rose pink colour will be given. This colour is due to the orthocresol and metacresol present in B.P. cresol, and not to the paracresol, which resembles carbolic acid in giving a relatively negative result. The method of distinction described depends largely upon the temperature employed and the length of time the mixture is allowed to stand. It is therefore important that the phenol and reagent should be kept cool both at the time of admixture and after mixing, also that the admixture should not be allowed to stand for more than five minutes, if small amounts of cresol are to be detected. The test may also be used to distinguish liquefied orthocresol from metacresol. When the characteristic colour has developed the material is poured into excess of aqueous potash. If the phenol be orthocresol the colour will become markedly intensified, but this will not happen if it be metacresol.

Some Distinctive Tests for Phenols Involving the Use of Hydrogen Peroxide

By Alan H. Ware

[Abstract]

Tests which fall under two heads are described in this paper. Hydrogen peroxide is itself the principal reagent in the first series, while the second group concerns tests in which peroxide is used to hasten, accentuate or distinctively alter the effect of the principal reagent. The method which has given the greatest number of distinctive results is described as follows:—The reagent is prepared by mixing 1 c.c. of solution of hydrogen peroxide (10 vol.) with sufficient concentrated sulphuric acid to make 50 c.c. About 0.05 gm. of the phenol to be tested is dissolved in 3 to 4 c.c. of concentrated sulphuric acid in a dry test-tube. An equal volume, or less, if a marked colour-reaction occurs, of the reagent is then added and intermixed. The mixture is allowed to stand from one to five minutes to allow of the maximum development of colour. The final colour and any change of colour which occurs is noted, and then water is added drop by drop until no further distinctive change occurs. Occasionally a better result is given if one drop of the aqueous solution of hydrogen peroxide (10 vol.), instead of the sulphuric acid admixture, be added to the solution of the phenol in the strong acid. Most of the results described were obtained by the first method, but those with guaiacol, salol, alpha-naphthol, morphine and codeine were obtained by the second method. The first method was not tried with the three last-named of these, but with guaiacol and salol it gave almost negative results. The colour-reactions or negative results yielded are classified under two main heads.

The following tests, in which hydrogen peroxide is used to accentuate or alter distinctively the action of formaldehyde or dihydroxy-acetone on certain phenols in solution in sulphuric acid, are interesting and sometimes useful. They differ, with respect to the results obtained, from those given above or in previous papers.

In one test from 0.01 to 0.05 gm. of the phenol is dissolved in about 4 c.c. of concentrated sulphuric acid, and one drop of a 1-per-cent. aqueous solution of dihydroxy-acetone added, followed by one drop of 10-vol. hydrogen peroxide. Lastly water is added, drop by drop. Results obtained with thymol, gallic acid and catechol are shown. With other phenols tested the results are either more definitely akin to those which have been described for hydrogen peroxide alone or to those described in the separate paper in which dihydroxy-acetone and hydrobromic acid are used. The most specific test for gallic acid known to the writer is the following:—To about 4 c.c. of a solution of gallic acid in concentrated sulphuric acid add an equal amount of the sulphuric acid solution of formaldehyde. Mix, and as soon as a greenish or greenish-brown tint is evident add 1 drop of hydrogen peroxide solution (10 vol.). A rich red colour is given which bears well diluting with water. If to the diluted solution aqueous ammonia is carefully added a deep true blue is given. No other phenol known to the writer except gallotannin (which gives an inferior result) gives any such results as those described, and gallotannin may be readily distinguished from gallic acid.

There was no discussion.

Science Section—Wednesday Afternoon

Owing to an alteration in the arrangements in connection with the official photograph the resumption of the science session was delayed somewhat on Wednesday afternoon; this and the early departure of the charabancs for the garden party resulted in a meagre attendance of members to discuss the remaining papers. The first paper, which, in the absence of the author, was read by Mr. Eastland, was on the subject of :—

The Assay of Hyoscyamus Leaves and Extract of Hyoscyamus, B.P.

By Charles M. Caines, F.I.C.

[Abstract]

This paper was suggested by a previous paper on the assay of belladonna leaves and extract of belladonna, the object being to ascertain how far the methods described were applicable to the assay of hyoscyamus leaves and extract. The methods employed include the following :—(1) The B.P. method recommended for belladonna leaves; (2) the U.S.P.X. method recommended for hyoscyamus leaves; (3) the P.G. VI method recommended for hyoscyamus leaves; (4) Eder's method for belladonna leaves; (5) van Itallie's method for belladonna leaves; (6) the suggested method. The results of the determination are

BRITISH PHARMACEUTICAL CONFERENCE 1929

as follows, the figures representing percentage of total alkaloid calculated as hyoscyamine :—

Hyoscyamus leaves

B.P.'14	U.S.P. X	P.G. VI	Eder	van Itallie's	Suggested method
0.10*	Unworkable	0.96†	0.11	0.10	0.13

* Troublesome, but not intractable emulsion.
† Re-extracted, 0.09 per cent.

Extract of hyoscyamus

B.P.'14	U.S.P. X	P.G. VI	Eder	van Itallie's	Suggested method
0.28	0.29	0.49*	0.27	0.20	0.30

* Re-extracted, 0.24 per cent.

There is no official method for the assay of hyoscyamus leaves, and the method followed was that given in the B.P. under belladonna leaves. The results are low, due to the formation of obstinate emulsions which, though troublesome, are amenable to the customary methods of dealing with such emulsions In the case of the extract the result is only slightly low. In the case of the U.S.P. the initial extraction of the alkaloids from leaves is thoroughly satisfactory, but any attempt to remove the alkaloids from the solvent by acid extraction is attended by the formation of emulsions which are not amenable to any form of treatment. Evaporation of the solvent, re-solution in chloroform and attempts to extract by acid treatment are attended with the formation of equally intractable emulsions. In the case of the extract the emulsions formed are amenable to treatment with the P.G. VI method. The results are abnormally high owing to the retention of ammonia by the solvent, and re-extraction yielded a low result in the case of both the leaves and the extract. Eder's method yields a very close approximation to the truth, but the numerous weighings and the difficulty attending the weighing of such a volatile solvent as ether are tedious and objectionable, and although from the economy of time the process has much to recommend it, it is a process which one would only select if approximate results were desired in the quickest possible time Results by van Itallie's process are low and it is sometimes difficult to obtain the full 50 c.c. of clear filtrate finally required for evaporation. The use of $N/10$ volumetric acid solution is not to be recommended.

The suggested method is based upon the recommendations for the assay of the tincture of belladonna of the B.P. A weighed quantity of 10 gm. of the finely powdered leaves or extract is moistened with alcohol (70 per cent.) and packed carefully into a minature percolator and percolated with alcohol (70 per cent.) until ten or a dozen drops of the percolate, when evaporated to dryness on a watch-glass, yield no reaction with Mayer's reagent, when dissolved in a drop of $N/10$ sulphuric acid. The percolate is evaporated at a gentle heat on a water-bath to a volume of approximately 10 c.c., cooled, and the contents of the dish transferred to a separator. The dish is washed first with 2 c.c. of alcohol (70 per cent.) to remove any separated material, then with 3×5 c.c. of water, followed by 2 c.c. of ammonia solution and finally with four successive quantities of 5 c.c. chloroform. The contents of the separator are then vigorously shaken for three minutes and allowed to separate. The chloroform solution is drawn off into another separator and the contents of the first separator are shaken with two consecutive quantities each of 20 c.c. of chloroform, the liquid being allowed to separate and the chloroform solution removed and added to the contents of the second separator. A few drops of the chloroformic extract are evaporated on a watch-glass, the residue, if any, dissolved in one drop of $N/10$ sulphuric acid, two drops of water added and the liquid tested with a drop of Mayer's reagent. In the event of a positive reaction being obtained, extraction is continued until the whole of the alkaloids are removed. The mixed chloroformic solutions are now shaken for three minutes with three consecutive quantities of 30 c.c. of a mixture of one part of sulphuric acid solution and two parts of water, and after complete separation the acid liquids are drawn off, mixed, filtered through a small 7 cm. filter paper, which is washed with 10 c.c. of a similar acid mixture. The mixed acid filtrate and washings are washed with 10 c.c. of chloroform, which is removed and rejected. The acid solution is made alkaline with ammonia solution in slight excess and extracted with 2×20 c.c., followed by 2×10 c.c. of chloroform. The mixed chloroformic solutions are washed with 10 c.c. of water, which is removed and rejected. The chloroform is distilled off almost completely, the last portion of chloroform being removed by gently blowing or aspirating air through the flask, warmed in the water-bath in which the chloroform has been distilled off. The residue is dissolved in 3 c.c. of ether, and the ether removed in a similar manner. Two c.c. of absolute alcohol is added, which is removed in turn, in the same way, and the residue is then dried until constant in weight, at a temperature of 80° C., and weighed. It is then dissolved in 20 c.c. of $N/20$ sulphuric acid solution, five or six drops of methyl red solution added, and the excess of sulphuric acid solution is titrated with $N/20$ sodium hydroxide solution. The number of c.c. of $N/20$ sodium hydroxide solution used is deducted from 20; the difference multiplied first by 0.01446 and then by ten, the product being the percentage of total alkaloids calculated as hyoscyamine. It is recommended that the titrated solution be transferred to a separator, made slightly alkaline with ammonia solution and shaken with 10 c.c. of chloroform. The residue left on the evaporation of 1 c.c. of this chloroformic liquid, when evaporated to dryness on a watch-glass with a few drops of fuming nitric acid, should yield the characteristic purple-violet colour of van Itallie's test when moistened with a few drops of $N/10$ volumetric alcoholic potassium hydroxide solution. The author thanks Allen & Hanburys, Ltd., in whose laboratories the work was carried out.

DISCUSSION

The CHAIRMAN said that this review by Mr. Caines formed a fitting and suitable sequel to the paper given last year on the assay of belladonna leaves and extract of belladonna. It was well known that low results were often obtained. Mr. Caines used 70 per cent. alcohol only for extraction, but he (the chairman) was not sure that it was the usual experience.

Mr. JORDAN said he would like to know the exact difference between drying the reside with ether and the B.P. process.

The next paper, also read by Mr. Eastland, was :—

Note on the Keeping Properties of Ung. Belladonnæ B.P.

By CHARLES M. CAINES, F.I.C.

[ABSTRACT]

THE question having arisen whether the official ointment of belladonna deteriorated in alkaloidal strength on keeping, authenticated specimens of the ointment were examined from time to time over a period of one year, and the results of this examination are recorded in the following table :—

Date of Examination	No. 1. Per cent. of total alkaloids (as atropine)	No. 2. Per cent. of total alkaloids (as atropine)
July 1928 ..	0.61	0.61
October 1928	0.61	0.60
January 1929	0.59	0.60
April 1929 ..	0.59	0.58

BRITISH PHARMACEUTICAL CONFERENCE 1929

The results show that the ointment does not deteriorate in alkaloidal strength within a reasonable period of time. The method of determination is as follows :—A weighed quantity of 5 gm. of the ointment is transferred to a separator by means of 50 c.c. of chloroform, using separate quantities of the chloroform to remove the fatty ingredients to the separator, and aliquot portions of 30 c.c. of a mixture of one part of diluted sulphuric acid and two parts of water to transfer the water-soluble extractive. The separator and its contents are thoroughly shaken for two minutes, allowed to separate, and the chloroformic solution transferred to another separator, and shaken with a further 30 c.c. of a similar acid mixture. The chloroformic liquid is removed, and the complete removal of the alkaloids ensured by testing a few drops of the acid aqueous extract with Mayer's reagent. The chloroformic solution is rejected, and the mixed acid aqueous solutions filtered through a small filter-paper, which is washed with 10 c.c. of a similar acid mixture. The mixed acid filtrate and washings are shaken with 10 c.c. of chloroform, which, after separation, is removed and rejected.

The acid liquid is then made alkaline with ammonia solution, and the alkaloids extracted by shaking with four × 15 c.c. of chloroform, 10 drops of the final chloroformic extract being evaporated on a watch-glass, a drop of $N/10$ sulphuric acid and 2 drops of water added, and this liquid tested with a few drops of Mayer's reagent to ensure that the whole of the alkaloids have been removed. The mixed chloroformic solutions are washed with 10 c.c. of distilled water, the chloroform evaporated almost to dryness, the final traces of chloroform being removed by a current of air from a bellows. The residue is dissolved in 3 c.c. of ether, which is in turn similarly removed, 2 c.c. of absolute alcohol added, and this in turn evaporated off in a similar manner. The residue is dried at 80° C. till constant in weight and weighed. It is dissolved in 20 c.c. of $N/20$ sulphuric acid solution, a few drops of methyl red solution added and the excess of $N/20$ sulphuric acid solution titrated with $N/20$ sodium hydroxide solution. The number of c.c. of $N/20$ sodium hydroxide solution used is deducted from 20 c.c., the difference is multiplied first by 0.01446 and then by 20, the product representing the percentage of total alkaloids, reckoned as atropine, present in the ointment.

The author expresses his thanks to Allen & Hanburys, Ltd.

Discussion

The Chairman said that this was a paper to clear up a problem raised some months ago as to the deterioration of the ointment.

Dr. Hampshire said that there was considerable need for knowledge to be available as to the keeping properties of drugs and preparations. It was advisable to record changes which might take place between the time the article was made and used. Sometimes no tests for the finished product were provided, and it was essential that the finished article should be all right even after a considerable time.

The next paper considered was :—

The Oxidation of Ether—The Effect of Certain Gases

By F. C. Hymas and G. Middleton

[Abstract]

Recent investigations concerning the stability of ether show that there is now supplied commercially anæsthetic ether of such purity that it may be kept for a prolonged period without undergoing an appreciable amount of oxidation. On arrival in the hands of the anæsthetist such ether is free from decomposition products. The possibility of oxidation taking place during administration has received less attention than its importance warrants. The four gases employed in the experiments were air, oxygen, carbon dioxide and nitrous oxide, and mixtures of these in equal volumes.

A measured volume (3 litres at N.T.P.) of the gas was passed under a pressure of 70 mm. of mercury through a Berkefeld filter candle (No. 8) immersed in 250 c.c. of ether, so that the gas entered the ether in a fine cloud of minute bubbles, giving the maximum surface of contact. The ether was contained in a white glass bottle of 6 cm. diameter and 2.5 mm. wall thickness. The temperature was kept constant at 20° C. (± 2°). Each experiment lasted approximately two and a half hours, during which time the ether was exposed at a distance of 10 cm. to the light of a 60-watt gas-filled lamp. The radiant heat from the lamp was screened off by a 5 cm. thickness of saturated potassium alum solution, and all other light was excluded. Immediately following the completion of each experiment, the residual ether was made up to its original volume with pure ether, and the amount of peroxide and aldehyde in the treated sample were estimated, all determinations being made in triplicate. Peroxide was determined by the ferrous thiocyanate method, and aldehyde colorimetrically by means of Schiff's reagent. The effluent gases were bubbled through distilled water, which was subsequently tested for dissolved aldehyde and peroxide, allowance being made where necessary for the solubility of the oxygen in the water. In no case was any peroxide detected in this liquid after an experiment, but minute traces of aldehyde were generally found. Pure and impure samples of ether were used, and the results are tabulated by the authors.

Of the gases under consideration, the mixture of oxygen and nitrous oxide is the most active in producing oxidation. While, in the treated samples, the amount of peroxide shows a general increase, the aldehyde content usually decreases, indicating probably that the peroxide is a product of oxidation of the aldehyde initially present in traces. This view receives support from the fact that the action is most marked where the original aldehyde content is high, and is to be expected as acetaldehyde forms peroxide much more rapidly than ether. The probable explanation of the comparative smallness of the amount of aldehyde formed is that the duration of the experiment was too short to allow of any appreciable decomposition of the peroxide. A number of samples of residual ether from the bubblers of anæsthetic apparatus have been examined. In all cases these residues were heavily contaminated with peroxide and aldehyde. It follows that it is important to take all possible steps to prevent the oxidation of ether at the time of its administration. In order to reduce the extent of the oxidation it is necessary (1) to avoid exposure to light (e.g., by use of dark amber bottles), (2) never to allow residual ether to accumulate in the apparatus, and (3) to use means of inhibiting oxidation such as that recently suggested by Hewer, namely, placing a strip of copper in the bubbler.

Discussion

The Chairman said that the quality of ether was a subject of extreme importance to the anæsthetist. It was not generally realised that ether was a readily oxidisable substance. He thought that anæsthetists did not take sufficient care as to residues in their apparatus. Oxidation was inhibited by the use of metallic copper, and according to recent medical literature tin was also useful as a container as it inhibited the formation of aldehydes.

Mr. D. Lloyd Howard said that it was heartbreaking that after many years of research and a firm taking so much trouble to supply pure ether that anæsthetists were so careless in its use. If contact with bright copper inhibited oxidation it would be a great benefit if this fact was known.

Mr. Sheppard said he had observed that reduced iron put into a shop round of ether changed colour after a few months.

Mr. Fouracre thought that the table of figures given were useful for reference as ether was often given in combination with carbon dioxide and nitrous oxide.

BRITISH PHARMACEUTICAL CONFERENCE 1929

The following paper was taken as read :—

Photo-Chemical Methods of Testing Sources of Ultra-Violet Radiation

By F. C. HYMAS

[ABSTRACT]

INCREASING use of ultra-violet radiation for a variety of purposes has introduced the problem of measuring in a rapid and reliable way the efficiency of the light sources. Measurements can be made by spectrographic methods, but these require expensive equipment; moreover, the results need experienced interpretation. Suggestions have been made with a view to devising a test which is simple and rapid in application. With the notable exception of the photo-electric method of Harris, based on earlier work by Griffith and Taylor, the majority depend on photo-chemical reactions. The principal published methods are those of Webster, Hill and Eidinow, dependent upon the bleaching of methylene blue in aqueous acetone, of McKenzie and King, based on the liberation of chlorine from carbon tetrachloride, and of Anderson and Robinson, involving the catalytic decomposition of oxalic acid. The principle of the Anderson and Robinson method is the use of uranyl sulphate as a catalyst in the decomposition of oxalic acid in aqueous solution. The two latter have been studied at some length, together with a method devised by the author, based on the well-known liberation of iodine from potassium iodide. The decomposition of potassium iodide has been studied by previous workers. In the earlier work measurements of the iodine liberated have most usually been made with standard sodium thio-sulphate in acid solution. Since the amount of alkali liberated is exceedingly small, however, the acid is not necessary, and serves only to complicate the reaction. In the form of the test recommended, enough oxygen is present in solution to complete the reaction. The life histories of a number of quartz-mercury vapour lamps have been followed by testing them at intervals. Where divergencies are apparent, an attempt has been made to investigate the variations in the resp ıse of the tests at different frequencies. The details of these methods, as applied by the author, are given, exposure being made for a period of ten minutes, at a distance of 17.5 cm. from the centre of the arc, in a horizontal direction, at right angles to its axis. The author's suggested method is as follows : The quartz test tube is filled with a $N/10$ solution of potassium iodide containing 0.1 per cent. of dissolved starch, stoppered, and exposed to the rays. The blue violet colour which develops is evaluated in terms of the Lovibond scale. For a test to be quantitative, the amount of reaction should be proportional to the energy absorbed. Accordingly, the progress of the reaction with time was determined for each test. Three series of exposures were made with a lanp of average intensity, which remained sensibly constant over the period covered by the determinations. It seems that the reaction velocity, using carbon tetrachloride, increases with time, and is only approximately constant for short periods. The reaction involved is complex, and some of the substances produced may have catalytic properties. Only when the exposure is brief, therefore, are the mean results proportional to the intensity of the radiation. The decomposition of oxalic acid proceeds at a constant rate until about 70 per cent. has disappeared. The longest exposures have failed to indicate decomposition of all available reagent. This effect is due to a secondary reaction, which involves the decomposition of the uranyl salt itself. A precipitate of hydrated oxide is formed, and this reduces the concentration of the catalyst and increases the opacity of the solution. A short exposure, sufficient to produce about a third of the total possible reaction, will, however, give satisfactory results. The depth of colour produced by the formation of starch-iodide is directly proportional to the energy absorbed for exposures up to twenty minutes. This result has alsc been obtained for exposures at varying distances from the source, in which case the figures have agreed with the inverse square law. For exposures of longer duration than twenty minutes the colour produced is too intense for accurate measurement, and although it seems to increase more rapidly than at first, on prolonged exposure fading finally occurs. From the results of these experiments an exposure of ten minutes appeared to be suitable and convenient, and was adopted as standard.

The increase in velocity of reaction with rise of temperature has been determined for the second and third methods. Bruner and Kozak found practically no temperature coefficient for the decomposition of oxalic acid by uranium salts; while Anderson and Robinson give the temperature coefficient 1.035 for 10 deg. over a range of temperature 25 deg.—45 deg. C. In the present case determinations with the potassium iodide method were made at temperatures between 25 deg. and 62 deg., the test tubes being cooled to room temperatures before matching. The results are shown in a table. The average temperature coefficient over the whole range is —1.042 for 10 deg. The negative sign is a curious result, the reason for which is not fully understood at present. It may possibly be due to partial hydrolysis of the starch at the higher temperatures. In the experiments recording the life-histories of the lamps, the maximum temperature variation allowed was 30 deg.—35 deg. Under these conditions the effect of temperature was negligible. Much difficulty was experienced in obtaining concordant results by the use of carbon tetrachloride. In view of the comparatively high vapour tension of carbon tetrachloride at the temperature of the experiments (176 mm. at 35 deg. C.), it seemed possible that the vapour present might play a considerable part in the reaction. A number of experiments were made, therefore, in which the liquid and vapour phases, separately, were irradiated, a screen of lead foil being used. After exposure 1 drop of 10 per cent. aqueous potassium iodide was added and the colour matched. The results are tabulated. The possibility of the differences being due to ozone formed from the air was excluded by the exposure for similar periods of tubes containing air only. The results were uniformly negative. It thus appears that the reaction is most intense in the vapour. This constitutes a serious disadvantage, as it greatly increases the difficulty of accurate measurement of the reagent, renders the test more liable to the effects of temperature variations, and, above all, introduces the certainty of loss of part of the products of the reaction when the stopper is removed from the tube. These conditions render the test so uncertain that it was ignored in the final comparisons Experiments, carried out over several months, have led to the result that, in each case, the apparent deterioration of the lamp is more rapid when measured by the potassium iodide method than when that employing oxalic acid and uranyl sulphate is used. This is shown by means of figures which represent the fall of efficiency of three separate lamps. The efficiency of each lamp, by either method, at the commencement of comparison, has been arbitrarily plotted as 100 per cent., and successive readings expressed as percentages of this initial figure. In every case the potassium iodide method gives the lower curve. It is evident that the rays effecting the reactions are not the same in both cases. Potassium iodide solution $N/10$+0.1 per cent. of starch absorbs completely all rays shorter than 2625 Å., and partially to 3500 Å. The absorption at the higher limit is very slight, and is only apparent in thicknesses of 10 cm. or more. On this evidence the differences between the two methods become intelligible, for if, as previous experiments indicate, the deterioration of a quartz mercury-vapour burner is due to chemical decomposition of the silica by ultra-violet light of very short wave length with the deposition of silicon, the result will be a gradual upward extension of the total absorption band; this will affect the potassium iodide method first, and cause it to give lower values. The rise of the oxalic acid curve may indicate a slight fall in temperature of the arc with age, resulting in a movement of the maximum energy output to a higher wave-length to which this method is more sensitive.

BRITISH PHARMACEUTICAL CONFERENCE 1929

This discrepancy is still more marked when other sources of radiation are employed. In one case, using a tungsten alloy arc, the response of the oxalic acid test was relatively three times as great as that of the potassium iodide method. This would be expected from a study of the published U.V. spectrogram of the arc in question, which reveals strong emission between 3500 Å. and 4200Å. The author has employed the potassium iodide test continuously for the last two years, observations with individual lamps having in some cases covered a period of 4,000–6,000 hours. The lamps show striking similarities in their behaviour, particularly as regards the limiting efficiency which they attain with age. A rapid fall of emission occurs in the first thousand hours, but becomes progressively slower. The final portion of the curve runs almost parallel to the time axis and shows a steady residual output of radiation which does not appear further to diminish however long the lamp is running. This presumably denotes an upper limit to the absorption band of the decomposed silica occurring below 3500 Å. It will be seen from the foregoing results that when studying the emission of ultra-violet lamps the choice of the correct test is of primary importance. Due regard must always be paid to the correlation of the selected test with the effective wave-length.

Summary

Three chemical methods of testing the emission of ultra-violet lamps are discussed. The effects of duration of exposure, of temperature, and of age of lamp have been studied. One of the methods is shown to be unsatisfactory. Comparison of the results of the remaining two shows that the tests yield different records of the apparent rate of decrease of emission, since they respond to different regions of the spectrum.

The author thanks the directors of The British Drug Houses, Ltd., for permission to publish this work.

Discussion

The CHAIRMAN referred to the importance of testing the efficiency of mercury vapour lamps, and mentioned that in measurements of the strength of sunlight for certain places the quantity of ultra-violet radiation has now been included in the Press.

The final paper was :—

A Note on the Potency of *Digitalis Lanata*

By FRANK WOKES

[ABSTRACT]

AT the beginning of 1929 there was submitted to the Pharmacological Laboratories of the Pharmaceutical Society, by Mr. Norman Evers, a sample of tincture of digitalis (1 in 10) prepared from *Digitalis lanata* leaves which had been received from Vienna. The suppliers of the leaves claimed that *D. lanata* is by far superior to the drug in commerce (*purpurea*), and physiological tests carried out repeatedly at the Pharmacognostical Institute of the University of Vienna confirmed this. The claim stated that less than 0.001 gm. of *lanata* is sufficient to cause systolical stoppage of the heart function in the frog per 1 gm. of animal, while 0.005 gm. of *purpurea* is wanted to attain the same effect. This sample of tincture was assayed by the cat method in the usual manner and found to possess an average potency of 432 ± 47 per cent. of that of the international standard, as the average of four experiments. Since this result lent support to the claim that *D. lanata* was several times more active than *D. purpurea*, it was considered worth while to make a further investigation. A quantity of the leaves from the sample which had been employed in the manufacture of the tincture was obtained. These leaves were examined by Mr. T. E. Wallis, and found to be identical both macroscopically and microscopically with an authentic specimen of *D. lanata* leaves. . . . The leaves were then carefully sorted, and 80 gm. of typical leaf, free from stalk, was chosen and dried in an air oven at 50° to 60° C., to constant weight, yielding 68.05 gm., indicating a content of 14.9 per cent. of moisture in the original sample. The dried leaves were reduced to No. 20 powder and stored in a dry corked glass bottle, from which portions were taken for the preparation of infusion and tincture. From the dried powdered leaves there was prepared a 0.125-per-cent. infusion, according to the method described by the International Conference, which extracts the leaves for fifteen minutes with water at 90° C. The infusion was filtered, and sodium chloride added to make a concentration of 0.9 per cent. This infusion was essayed by the cat method. The mean of three experiments gave an average lethal dose for the dried leaf of 0.0217 ± 0.0013 gm. per kilo. The average lethal dose of the international standard digitalis powder had previously been found to be 0.076 gm. per kilo. Thus assay of the water-soluble constituents of the *D. lanata* leaves showed them to possess 350 ± 22 per cent. of the activity of the international standard powder. There was also prepared a 10-per-cent. tincture by the percolation process of the British Pharmacopœia, employing 70-per-cent. alcohol. This tincture was found to contain 3.60 per cent. of total solids, as compared with 2.64 per cent. in the original tincture.

An assay of this tincture was made by the cat method, employing a dilution of 1 in 75 in 0.9 per cent. sodium chloride solution. The average of four experiments gave a lethal dose of 14.5 ± 1.7 c.c. per kilo of the dilution, equivalent to 0.193 ± 0.023 c.c. per kilo of the original tincture, or 0.0193 ± 0.0023 gm. per kilo of the powdered leaves. A tincture, freshly prepared from the international standard digitalis powder (when assayed in the same way), was found to have a lethal dose of 0.76 c.c. per kilo of the original tincture. Thus the assay by the cat method of the alcohol-soluble constituents showed 394 ± 45 per cent. of the activity of the standard powdered leaves. The tincture was also assayed by the frog method, employing the technique of Trevan. Two experiments were carried out, in each of which twenty frogs received the same dose of the *D. lanata* tincture per unit body weight, and twenty frogs received another dose of a tincture freshly prepared from the international standard digitalis powder. The relative potency of the two tinctures was calculated by taking the percentage mortality produced in each case, and applying this to the characteristic mortality curve for frogs receiving digitalis. Among the frogs receiving the *D. lanata*, it was noticed that the action of the drug was sometimes unusually delayed. A few animals which were torpid, but still living at the end of twenty-four hours, died on the second or third day of the experiment. On the other hand, among frogs which had received the standard tincture (made from *D. purpurea*), and which were kept in running water under the same conditions, no alteration in mortality took place after the first day. For the purpose of this assay, the comparison was made between mortalities found at the end of the first twenty-four hours. If the comparison had been made at the end of three days, the observed potency of the *D. lanata* would have been between 30 and 50 per cent. greater. An attempt was made to ascertain the potency of the sample of *D. lanata* leaves received from Dr. Gittens in the previous year. Only four leaves were available, which yielded 0.97 gm. of No. 20 powder. From this there was prepared 9.7 c.c. of tincture, which was tested both on cats and on frogs. By the cat method the tincture was found to have a lethal dose of 0.69 ± 0.04 per kilo, as the average of four experiments. Comparing this with the figure of 0.76 c.c. per kilo, obtained for the standard tincture, this sample of *D. lanata* was found to possess only 111 ± 7 per cent. of the potency of the standard digitalis powder. By the frog method the tincture was found to possess a potency of 218 ± 18 per cent. of that of the standard digitalis powder as the average of three experiments. Thus the frog potency of the sample was twice the cat potency. In both the cat and the frog methods considerable difficulty had been experienced in obtaining satisfactory

BRITISH PHARMACEUTICAL CONFERENCE 1929

end-points owing to the greatly delayed action of the drug. The quantity of material available was too limited to permit the repetition of these experiments, and it was considered that the results could not be accepted without further investigation.

The work of Trevan on the assay of digitalis by the frog method has shown the impossibility of defining with any accuracy the potency of a given sample by quoting an isolated minimum lethal dose, as was done by the suppliers. The deviation in susceptibility between individual frogs is so great that, although due allowance has been made for difference in body weight, some frogs will tolerate more than twice as much digitalis as would have killed certain other frogs. The only satisfactory method of using frogs is to administer doses which will kill some but not all of the frogs. Not less than 20 frogs should be put on each dose, and the most accurate results will be obtained if the mortality lies between 20 and 80 per cent. Even when these precautions are taken, it is still found that the dose of a given sample per unit body weight which causes a certain percentage mortality varies considerably from day to day. In the author's experience this variation has sometimes exceeded 100 per cent. The difficulty is, of course, overcome by ensuring that the mortalities employed calculating any one result are both obtained on the same day. There is the difficulty that the frog potency of a tincture of digitalis appears to diminish fairly rapidly on storage, according to results recently published. Hence, it is necessary to employ freshly prepared tinctures, both of the standard and of the sample being assayed. In the case of this particular sample of *D. lanata* it is not known how many, if any, of these necessary precautions were adopted by those responsible for the assay whose result is quoted by the suppliers. It is therefore very difficult to estimate the degree of accuracy which may be expected in this result. With this reservation a comparison is made between the result quoted by the suppliers, and the results obtained by the author. The frog potency is taken first. The claim of suppliers was that 0.1 mgm. of the sample per gm. body weight of frog was a lethal dose. In this investigation four different experiments on frogs have been made with tincture of *D. lanata*, two with the tincture made by Mr. Evers and two with the tincture made by the author. In each experiment twenty frogs were given the same dose and another twenty frogs a dose of a tincture freshly prepared from the international standard powder. Each of the experiments was carried out on a different day. In one experiment the *D. lanata* failed to kill any frogs, owing to the dose chosen being too low. The actual dose employed was 0.125 c.c. mgm. per 100 gm. body weight, equivalent to a dose of 0.125 mgm. per gm. body weight of the actual leaves. Thus a dose 25 per cent. greater than that stated by the suppliers to be a lethal dose failed to kill any of the frogs. In another experiment all the frogs were killed. The actual dose employed was 0.19 c.c. per 100 gm. body weight, equivalent to 0.19 mgm. per gm. body weight of the actual leaves. Practically 100 per cent. mortality was obtained with a dose almost twice that quoted by the suppliers as a lethal dose. From these results it appeared probable that the actual potency of the sample would be found to be definitely less than the suppliers had stated, but more than half of what they had stated. Neither of these experiments, however, could be used for the actual assay, and a further two experiments were therefore carried out on the tincture prepared by the author. In one of these experiments a dose equivalent to 0.16 mgm. of leaves per gm. body weight produced 30 per cent. mortality, whilst in the other a dose equivalent to 0.19 mgm. per gm. body weight led to a mortality of 40 per cent. From these results it was again indicated that the suggested lethal dose of 0.10 mgm. per gm. body weight was too low, and the potency of the sample less than had been stated. It is interesting to note that the suppliers had quoted 0.5 mgm. per gm. body weight as a lethal dose of *D. purpurea*. In the present investigation the dose of standard tincture given was equivalent to a dose of 0.625 mgm. of *D. purpurea* per gm. body weight, and this produced mortalities lying between 40 and 65 per cent. In a number of previous experiments in which doses equivalent to 0.5 mgm. of the standard digitalis powder per gm. body weight were employed, the mortality amongst the frogs has ranged from 20 to 55 per cent., the average being rather less than 50 per cent. Hence it might appear that the attempts to determine an average lethal dose had met with more success in the case of *D. purpurea* than with *D. lanata*. But it must be remembered that these results were obtained on one particular sample of digitalis powder. Other samples of *D. purpurea* can be found which vary considerably from this potency. In one case, for instance, a dose equivalent to 0.58 per gm. failed to kill any frogs, and in another case a dose of 0.43 mgm. per gm. killed all of them. Variations of over 100 per cent. can be found either between different samples examined on the same day, or between results on the same sample examined on different days. For the satisfactory assay of digitalis by the frog method, it is strictly necessary to carry out simultaneous experiments on the sample and on the standard, and make proper comparisons between the two results. When such a method was applied to this sample of *D. lanata* tincture, the potency was found to be 320±21 per cent. of that of the standard, which is considerably lower than might have been expected from the suppliers' claims. The cat potency of the same sample was 394±45 per cent., giving a cat/frog ratio of 1.23. The difference between these two results barely exceeds the combined experimental error. The cat potency of an infusion of the powdered leaves gave an intermediate value (350±22 per cent.), and the mean of all the cat results on this sample was 392±20 per cent., or considerably below the figure of 500 per cent. suggested by the suppliers. The tincture made by Mr. Evers had a higher cat potency (432±47 per cent.) than this average. It appeared to be more potent than the tincture made by the author, but the difference between the average cat figure on the two tinctures was less than the experimental error. On the other hand, it was definitely more potent than either the tincture as assayed by the frog or infusion assayed by the cat method.

In view of the rather wide differences in the results obtained by different methods it is hardly possible to give a satisfactory single figure for the potency of the sample. The latter is certainly more than three times as potent as the standard powder, and more than twice as potent as the most active sample of *D. purpurea* yet examined. On the other hand, its potency appears to be less than was suggested by the suppliers, and probably is between 3½ and 4 times that of the international standard.

Discussion

The Chairman said this was an important contribution and indicates clearly that this is a more important variety than the *purpurea*. Books of reference say little about it, but he believed that the *lanata* is used for making amorphous digitaline.

The Chairman, before declaring the business of the section closed, moved a vote of thanks to the authors, the Council of the Society and the editor of the "Quarterly Journal." This was cordially endorsed.

Delegates' Meetings

Delegates from branches of the Pharmaceutical Society assembled at the Mansion House on Tuesday afternoon, June 25, to listen to a paper by Mr. Arthur H. Jenkin, member of the Council, on "Schedules for Poisons and Potent Drugs, the Distribution of which should be Restricted," and Dr. E. G. Bryant's paper on "Pharmaceutical Research: Its Present Position and Future Possibilities. On Wednesday morning, June 26, Mr. Herbert Skinner, member of the Council, opened a discussion on "Is an Imperial Pharmaceutical Qualification Desirable?" Both meetings were held in private and reports are to be issued later.

BRITISH PHARMACEUTICAL CONFERENCE 1929

The Closing Session

THE closing session of the Conference was held at the Round Room, Mansion House, Dublin, on Thursday morning, June 27, the chairman (Mr. R. R. Bennett) presiding.

The CHAIRMAN called on the senior general secretary (Dr. C. H. Hampshire) to read the sixty-sixth

ANNUAL REPORT,

which included the following passages :—

Membership of the Conference now consists of members, honorary members and student-associates of the Pharmaceutical Society and the following corresponding members: home, 113; foreign and colonial, 20. Since the last annual meeting twenty-five new corresponding members have been elected and eight have retired under Rule 7. During the past session the Executive Committee has met on four occasions to make the arrangements for this meeting. The representatives of the Executive appointed to the Science Committee of the Pharmaceutical Society were Messrs. N. Evers, B. F. Howard, E. S. Peck and H. B. Mackie.

The following members have served on the Editorial Committee of the "Quarterly Journal of Pharmacy and Pharmacology": The Chairman, Messrs. C. E. Corfield and F. W. Gamble. The first volume of the journal was completed by No. 4 of 1928, and the four numbers constitute the "Year-Book of Pharmacy" for 1928. The Committee wish to draw attention to the fact that all members of the Pharmaceutical Society of Great Britain are members of the British Pharmaceutical Conference, and are entitled to receive the "Quarterly Journal of Pharmacy" on preferential terms. The annual subscription to members has been fixed at 10s. 6d. The compilation of a General Index to the "Year-Book of Pharmacy," to which reference was made in the report last year, has been completed and the volume is now in the press. It will shortly be on sale at the price of 12s 6d. per copy.

It is with great sorrow that the Executive records the death, since the last meeting, of Mr. Edmund White, who was actively connected with its work for so many years. Mr. White contributed many scientific papers to the proceedings of the Conference. He was one of the Honorary General Secretaries for six years, and later was Chairman at the Bath and Glasgow Conferences. He was a regular attender of the Conference, and his genial presence will be greatly missed. The Executive record their pleasure at the opportunity which has been given this year of meeting again in Ireland after a lapse of many years. The Dublin Conference will, they feel assured, remain long in the memory of those present by reason of the cordiality of the welcome extended and the success of the meetings. The Conference is invited to visit Wales next year, and there, again, a cordial welcome is promised. The Executive warmly commends to the members the invitation to visit Cardiff, which will be extended at the present meeting. With an invitation to visit Manchester in 1931 also before them, the Executive view the future of the Conference with confidence.

The adoption of the report was moved by the CHAIRMAN, seconded by Mr. L. MORETON PARRY, president, and carried unanimously.

TREASURER'S REPORT

The treasurer's report, read by Dr. F. W. Crossley-Holland, is summarised as follows :—

The accounts for 1928 show that the income from subscriptions paid by corresponding members was £61 8s. 6d., and the revenue from sales of the Year-Book was £34 5s. 10d., making a total income of £95 14s. 4d. On the expenditure side of the account the cost of the Year-Book amounted to £559 9s. 8d., whilst the general expenses of conference were £149 17s. 3d., making a total of £709 6s. 11d. The total amount expended is less than that of the previous year by the sum of £203 1s. 8d. It may be well to remind members of Conference that before the fusion of the British Pharmaceutical Conference with the Pharmaceutical Society of Great Britain the members of Conference paid an annual subscription of 10s. 6d. direct into the treasury of Conference, and the income then accruing to the Conference funds reached an annual figure of between £500 and £600. Apart from the afore-mentioned amounts, the Conference account shows at the end of the financial year a balance in hand of £310 12s., £200 of which is on deposit account. This balance in hand compares favourably with the sum shown as balance in hand of the previous financial year, which was £288 3s. 4d., exceeding it by the sum of £32 8s. 8d. The revenue credited to the Bell and Hills Fund during 1928 was £37 4s. 2d., and this sum represents dividends on the general gift to Conference funds of £1,250 consolidated stock, made by the late Alderman Clayton, of Birmingham, *plus* the interest on the sum of £200 placed on deposit account. The only expenditure from this fund during the financial year was the sum of £9 15s. 6d. This sum represents the amount paid to publishers in respect of a gift of scientific books to the library of the local branch of the Pharmaceutical Society on the occasion of the Cheltenham meeting.

The adoption of the report was moved by the CHAIRMAN, seconded by the PRESIDENT of the Pharmaceutical Society, and carried unanimously.

ELECTION OF OFFICERS

Mr. H. HUMPHREYS JONES (Liverpool) proposed the election of the following officers :—

President.—The president of the Pharmaceutical Society (Mr. L. Moreton Parry).

Chairman.—Mr. John Humphrey, Ph.C.

Vice-Presidents.—Messrs. E. M. Holmes, G. Claridge Druce, W. A. H. Naylor, R. Wright, J. F. Tocher, F. Ransom, E. H. Farr, E. Saville Peck, D. Hooper, W. Kirby, C. A. Hill, H. G. Greenish.

Vice-Chairmen.—Mr. F. W. Gamble and Mr. R. R. Bennett.

Treasurer.—Dr. F. W. Crossley-Holland.

General Secretaries.—Mr. C. E. Corfield and Mr. G. R. Boyes.

Other Members of Executive.—The chairman of the North British Branch of the Pharmaceutical Society (*ex-officio*); the president of the Pharmaceutical Society of Ireland (*ex-officio*); the president of the Pharmaceutical Society of Northern Ireland (*ex-officio*); Messrs. N. Evers, J. H. Franklin, C. H. Hampshire, H. B. Mackie, A. R. Melhuish, C. Noble, and three members representing the Council of the Pharmaceutical Society of Great Britain, Messrs W. J. Beardsley, T. Marns and H. Skinner.

Mr. H. HUMPHREYS JONES said that Mr. John Humphrey, Ph.C., former editor of "The Pharmaceutical Journal," would take Mr. Bennett's place, which he was particularly well qualified to fill. Dr. Hampshire, who had occupied the position as a general secretary for ten years, wished to retire. He had done excellent work here and elsewhere. Mr. Corfield was fully qualified to take up the position, and Mr. Boyes would be an able assistant.

Mr. MABEN said that he had pleasure in seconding the resolution proposed by Mr. Humphreys Jones, and he endorsed what had been said about the present chairman, whom he hoped they would see at many future conferences He also paid a tribute to Dr. Hampshire. The speaker expressed delight in being back in Dublin after twenty-eight years. They had received unbounded kindness and hospitality from the Dublin people at that time. That hospitality and kindness had been repeated on the present occasion.

The CHAIRMAN put the resolution to the meeting, and the officers were elected *en bloc.*

Mr. JOHN HUMPHREY responded on behalf of the officers for the ensuing year, and thanked the members cordially on behalf of his colleagues and himself. The first conference that he attended was thirty-seven years ago, and his aim would be to help to consolidate and build upon surer foundations this conference.

INVITATION TO CARDIFF, 1930

Mr. S. B. EASON said that he had pleasure on behalf of the Cardiff Branch of the Pharmaceutical Society to invite them to hold the next conference in the City of Cardiff. A special invitation to friends in Ireland was extended, and he hoped that they would come.

Mr. S. W. HAGUE, in supporting the invitation, said that Cardiff was a very modern city, and was well

BRITISH PHARMACEUTICAL CONFERENCE 1929

suited to receive the Conference. It was the capital of Wales, and a Welsh character would be given to the Conference to make it interesting. He hoped that it might be a success and they would make it enjoyable.

Mr. H. P. ARTHUR (chairman of the North British Executive) thanked them for the invitation, and thought that it would be a compliment to the new president of the Pharmaceutical Society of Great Britain. He proposed that the cordial invitation to visit Cardiff be accepted.

Mr. BURTON CLARKE (Cheltenham) seconded the proposal.

The CHAIRMAN (Mr. R. R. Bennett) said he could add little to what the previous speakers had said. He was delighted that they could look forward to a meeting in Cardiff next year where they would see a city possessing magnificent municipal and national buildings. The resolution "that this Conference should accept the invitation to visit Cardiff next year" was carried. The chairman said that Mr. Eason and Mr. Hague would be sure to convey the thanks of the Conference to their colleagues for their very acceptable invitation.

PRESENTATION OF BOOKS

The CHAIRMAN presented the books purchased out of the Bell and Hills Fund to the Pharmaceutical Society of Ireland. The books were selected by the Local Executive Committee, and as Mr. Fitzpatrick was not present he would ask Sir Thomas Robinson to accept them. He hoped that they would be useful to the younger members of the community.

Sir THOMAS ROBINSON briefly thanked them on behalf of the Pharmaceutical Society of Ireland. The visit of the Conference had been enjoyed and had reflected great credit on the Society. He paid a tribute to Mr. Bennett as chairman, who had ruled with a persuasiveness that did not call for authority. They of the local committee were proud of the Conference. He advised as many of the visitors as could do so to pay a visit to the Shannon Scheme.

VOTE OF THANKS TO CHAIRMAN

Mr. W. J. HARDY proposed a vote of thanks to the retiring chairman. Mr. Hardy said it did not take long to know Mr. Bennett and to appreciate his work and his worth. Perhaps no chairman had been so versatile as Mr. Bennett, who was one of the leading pharmacists in Great Britain.

Mr. FRANKLIN (Manchester) seconded the vote of thanks to the chairman. They had been fortunate in their chairman of the Conference, and Mr. Bennett had endeared himself to every visitor and every one with whom he came in contact. He had earned admiration and deep regard from all.

Mr. L. MORETON PARRY said that they had appreciated the qualities of Mr. Bennett during this Conference and during his two years of office. The resolution was carried with enthusiasm and "For He's a Jolly Good Fellow" was sung.

Mr. BENNETT said he felt that now he had a difficult task to express thanks for the too flattering remarks. The office of chairman of the Conference had carried with it an honour and responsibility of which he was proud. He thanked them on his own and on his wife's behalf for the overwhelming kindness since they had landed in that warm-hearted city. The meeting had exceeded their expectations, and this was due to the self-sacrificing labours of their Dublin friends. He would like to take the opportunity of expressing appreciation of the work done by the two general secretaries, Dr. Hampshire and Mr. Corfield. Their work had been beyond praise. He desired to pay a real tribute to Dr. Hampshire as it was the last time he would function as secretary, and he would ask them to show by acclamation the appreciation of what Dr. Hampshire had done at this and previous meetings.

Dr. HAMPSHIRE, replying, said that this was one more evidence of the goodness of heart of the chairman. He thanked them for the recognition of his work and was sorry to lay down the office. He became senior secretary when it was decided to effect the change in Conference organisation, and it fell to his lot to function during the inevitable period of readjustment which followed the change. The Conference had not sacrificed its character as a scientific body, and he hoped that the policy would be continued. He would like to add a word of appreciation to Mr. Linstead for the way he had worked during the period of change.

The CHAIRMAN then declared the proceedings closed.

Associations' Meetings

Chemists' Dental Society.—The annual meeting was held at the New Horticultural Hall on June 20. The president (Mr. F. C. Ashford), who was in the chair, expressed the opinion that the dental profession was passing through a critical period. Dental clinics were being opened up and down the country, especially by the C.W.S. Ministry of Health control had already resulted in increased activity on the part of the regional dental officers and great interference was taking place between dentists and patients. A loophole in the Dentists Act was being used to register companies under the ægis of approved societies anxious to exploit dentists and obtain a share of dental profits. Representation on the new Dental Benefit Council was monopolised and shared between the larger dental societies; no protest has so far been made by this Society, but proceedings are being watched and action will at once be taken if required. Advertising of dental surgeons by approved societies was taking place. A discussion followed the address regarding the fees for non-State-insured members of approved societies, and the Insurance scale was agreed to for these, different fees to members of the same family not being advisable. Objection was taken to suggestions that the older societies alone should attend to N.H.I. work. Loyalty to the P.D.S.A. was generally expressed, although the C.D.S. is quite prepared to look after all the interests of members. The treasurer's report showed an increased balance due to the enhanced value of investments. The following officers were elected for the year: *President*, Mr. S. Davis; *Vice-President*, Mr. H. Morgan; *Treasurer*, Mr. J. J. Laws; *Auditor*, Mr. W. E. Barker; *Council*, Dr. Templar Malins, Messrs. F. C. Ashford, F. R. Sutcliffe, C. C. Greensmith, E. Mowat, J. K. Lyons, G. I. Williams and W. E. Barker; *Secretary*, Mr. J. W. Roberts, 10 Tavistock Place, W.C.1. An interesting feature at the close of the meeting was the presentation of a barograph in a mahogany-framed glass case to the retiring president. Mr. Davis said that Mr. F. C. Ashford was one of the earliest members of the C.D.S.; and although an extremely busy man, taking a large share in public work as town councillor of Northampton and chairman of the Board of Guardians, he always found time to give to the Society, and his efforts were much appreciated.

Edinburgh.—The fourth botanical excursion of the present session of the Edinburgh Chemists', Assistants' and Apprentices' Association took place on June 12, when members travelled to Musselburgh. In the unavoidable absence of Mr. R. K. Gibson, the excursion was conducted by Mr. Eric Knott, Ph.C., and active field work was carried out on a new route out by the banks of the River Esk. Good specimens of plants, representing eighteen natural orders, were collected and fully described. The most interesting were a fine specimen of *Symphytum officinale* v. *patens;* a large plant in full bloom of *Scrophularia nodosa;* and a specimen in fruit of *Valerianella olitoria.* On the motion of Mr. J. J. Blackie, Ph.C. (president), a cordial vote of thanks was awarded to Mr. Knott.—The Cumming prize competition in practical pharmacy took place on June 14. The first prize, presented by Dr. John Cummings, was awarded to William J. Black, Annan, and the second prize, presented by the president, to Renwick C. Macgregor, Edinburgh.

Trade Report

The prices given in this section are those obtained by importers or manufacturers for bulk quantities or original packages. To these prices various charges have to be added, whereby values are in many instances greatly augmented before wholesale dealers receive the goods into stock, after which much expense may be incurred in garbling, packing, etc. Qualities of chemicals, drugs, essential and fixed oils, and many other commodities vary greatly, and higher prices than those here quoted are charged for selected qualities of natural products even in bulk quantities.

42 Cannon Street, E.C.4, July 4

IN view of the half-yearly stocktaking period and the holiday season, the general tone of the produce markets has remained quiet. Among crude drugs, a decline in the spot value of senega is a feature; cascara sagrada has a firmer tendency. Ergot has an easy undertone, with new crop Spanish offering at cheaper rates. All Japanese produce is firm in view of the considerable advance in the yen. Sumatra benzoin is fully steady, and Kordofan acacia is firm, bleached being scarce and dearer; cochineal and Dalmatian insect flowers are cheaper. Menthol and squill are easier. Tragacanth is in fair demand for the better grades. Aromatic seeds remain dull, with prices mostly unchanged. Coriander shows a slight rally for shipment, and Mazagan linseed is rather cheaper on the spot. Among pharmaceutical chemicals, the anticipated advances in phenacetin, phenazone and amidopyrin have now materialised. Methyl sulphonal and sulphonal are rather dearer. Bismuth salts have been reduced 6d. to 1s. per lb. by the makers owing to competition, the price of the metal being unchanged. Citric acid is weaker in second hands. Among the industrial chemicals, quiet markets are reported without any important changes. Formaldehyde continues unsteady, and potassium and sodium chlorates are slow of sale. Carbolic acid crystals remain firm. In the fixed oils section, palm oils show a sharp advance, while linseed oil and American turpentine are rather dearer. Cotton oils have also improved slightly; ground nut, coconut, soya and palm kernel are steadier.

Higher	Firmer	Easier	Lower
Amidopyrin	Bay oil	Antimony (Ch. reg.)	Bismuth salts
Anise oil, star	Camphor (Jp. tabs.)	Citric acid	Insect flowers (Dal.)
Cascara sagrada	Castor oil (Eng.)	Cochineal	Linseed (Maz.)
Cotton oils	Linseed oil	Cod-liver oil	Pimento (c.i.f.)
Geranium oil	Methyl sulphonal	Menthol (spot)	Senega (spot.)
Gum acacia (bleached)	Soya oil	Orange oil (W. Indian)	
Linseed oil	Sulphonal	Squill	
Palm oils	Turpentine		
Phenacetin			
Phenazone			
Rubber			
Shellac			

Cablegram

BERGEN, June 26.—The catch of cod since the opening of the season amounts to 78,600,000, against 64,215,000 on the corresponding date last year. The yield of steam-refined cod-liver oil amounts to 91,603 hectolitres, against 50,981 hectolitres at this time a year ago. The fishing is now closed, the foregoing figures being the final results. The market for finest new (1929) Lofoten oil is quiet and values are unchanged at from 103s. per barrel c.i.f. and upwards.

Crude Drugs, etc.

AGAR-AGAR is firm in view of the improvement in the yen. Sales include Kobe No. 1 at 3s. 8¾d. per lb. c.i.f.; spot value is 4s.

ALOES.—Curaçao continue firm, offering to arrive at from 105s. to 107s. 6d. per cwt. c.i.f. for t.q. Fine liver is extremely scarce on the spot, with up to 140s. per cwt. paid.

The exports from the Union of South Africa during January amounted to 214,514 lb. (£890), against 73,528 lb. (£576) in January 1928.

BENZOIN.—Supplies of Sumatra are getting into smaller compass and prices are fully steady. Good firsts offer at £10 to £11 per cwt.; good seconds £8 to £8 10s., and thirds at from £6 15s. to £7 2s. 6d.

CAMPHOR (REFINED).—Japanese slabs are quiet at 2s. 4½d. per lb. on the spot, and for July-August shipment 2s. 2d. c.i.f is quoted. Flowers offer at 2s. 10½d., and ¼oz. tablets are scarce at 3s. 3d. on the spot.

CARDAMOMS.—An auction of 40 packages Mangalore will be held to-day (Thursday).

CASCARA SAGRADA.—New season's peel for shipment from the Pacific Coast is firmer at 55s. per cwt. c.i.f., at which business is reported; spot values are from 57s. 6d. to 60s., according to age.

CASSIA FISTULA has been sold more freely on the Continent of late and stocks there are reduced. The London market is quiet, good Java pod offering at from 25s. to 27s. 6d. per cwt., and Indian at from 20s. to 22s. 6d.

CINCHONA.—At the auction to be held at Amsterdam on July 10, 1,344 packages (776 bales and 568 cases) Java pharmaceutical bark, weighing 45,812 kilos and containing the equivalent of 1,203 kilos. quinine sulphate, will be offered.

CLOVES are quiet, with Zanzibar offering at 1s. 4½d. per lb. on the spot. To arrive, there are sellers of June-August shipment at 1s. 1½d., August-October at 11½d. (paid), and October-December at 10¾d. per lb. c.i.f. The landings of Zanzibar in London during the week ending June 29 were 4 and the deliveries 56, leaving a stock of 1,663, against 9,463 last year and 12,487 bales in 1927. To date, landings of Zanzibar have been 4,174, against 10,383 in 1928, and the deliveries 4,898, against 10,449 in 1928.

COCHINEAL is easier, good blacks offering at 4s. 4d. to 4s. 5d. per lb., while silvers and greys are firm at 3s. 8d. to 3s. 9d.; spot stocks continue small.

COD-LIVER OIL is quiet, as is usual at this period, and prices are unchanged at from 102s. 6d. to 105s. per barrel c.i.f. London for finest new non-freezing Lofoten oil, with bids of 100s. suggested.

BERGEN, July 2.—The fishing for this year is now finished, and as it will be seen from our cable the output of cod-liver oil is considerable. Owing to prices being very reasonable, the demand for oil was improving, and the export of steam-refined quality amounts to 78,631 hectolitres, against 64,215 up to same time last year. Market for the finest quality is quiet at about 103s to 105s. c.i.f. London.

CROTON OIL continues very scarce at 6s. per lb. on the spot; it is difficult to get offers.

ERGOT has shown rather more inquiry, with prices easy, Russian offering on the spot at from 1s. to 1s. 2d. per lb., as to quality; new crop Spanish is offered at 1s. 10d. per lb. c.i.f.

GINGER is quiet but firm, West African offering on the spot at from 62s. 6d. to 63s. per cwt., and to arrive, sellers quote 62s. 6d. c.i.f

GUM ACACIA.—Kordofan still remains very firm. Natural on the spot is 92s. 6d. per cwt. and cleaned 97s. 6d. to 100s. Arrival business has been quiet, with sales of natural up to 92s. 6d. c.i.f., mostly from second hands, there being no offers available from original shippers. Bleached is very scarce on the spot and prices are higher. No. 1 quality is 150s., No. 2 140s., and No. 3 130s. per cwt. Reports state that most of the crop of bleached is here and supplies must last until next year.

INSECT FLOWERS.—The new Dalmatian crop now arriving is expected to be of fair-sized quantity. Good closed quality offer at 160s. per cwt., and half-closed at 140s. c.i.f.

IPECACUANHA.—Matto Grosso is quiet at from 13s. to 13s. 6d. per lb. on the spot.

LIME JUICE.—Spot stocks are being steadily reduced. Values of new crop are from 4s. 6d. to 5s. per gallon, and old crop 4s to 4s. 3d.

MENTHOL is dull of sale at 19s. 3d. per lb. on the spot for Kobayashi-Suzuki, and for forward shipment from 17s. 6d. to 18s. c.i.f. is quoted.

MERCURY.—A hand-to-mouth demand continues on the spot and the position is still unchanged, with fairly ample stocks available in importers' hands, and there is no indication of any change in the attitude of the mines. Spot terms range from £22 2s. 6d. to £22 5s. per bottle, less the usual discount. Eastern markets are very quiet, only small quantities being inquired for either from China or Japan. The American market is steady, with New York remaining at about $122 per bottle, duty paid. The Spanish mines shut down at the end of June, and it is estimated that their output during that month amounted to about 10,000 bottles. There will be no resumption of operations until the late autumn. According to the estimates received in one quarter the output of the Spanish mines for the season just ended was approximately 73,000 bottles.

PEPPER is easier. Fair black Singapore is 1s. 4¼d. per lb. on the spot and May-July shipment is 1s. 3⅞d. c.i.f. Lampong is 1s. 4¼d. to 1s. 4⅜d. spot. Sales to arrive include May-July shipment at 1s. 4d. to 1s. 4⅛d., August-October at 1s. 2⅝d. to 1s. 2¾d. to 1s. 2⅞d. c.i.f. Tellicherry is 1s. 4½d. spot and Alleppy 1s. 4¼d. spot. White Muntok is steady at 2s. 4d. per lb. on the spot. Sales to arrive include May-July shipment at 2s. 4d. to 2s. 4¼d., and August-October at 2s. to 2s. 0⅜d. to 2s. 0¼d. c.i.f.

PIMENTO is quiet at 1s. 2½d. per lb. on the spot. To arrive, July-August shipment is 123s. per cwt. c.i.f., and August-October 111. c.i.f.

PODOPHYLLUM ROOT.—*P. Peltatum* is quoted at 55s. per cwt. c.i.f., and at 65s. on the spot; *P. Emodi* is 50s. on the spot.

RUBBER is quite firm, and prices generally are ⅜d. dearer on the week. There has been much more activity during the past few days, and a fair amount of spot rubber has been sold. The firmness is mainly due to the fact that shipments from the East for the month of June are cabled as 40,400 tons, against 43,960 tons for the month of May. This reduction of 3,560 tons is regarded as a sign of a fall in shipments over the next few months, which naturally means a decreased production. Last week arrivals totalled 1,775 tons, whilst deliveries were 1,410 tons, showing an increase of 365 tons in the stocks. The London stock now stands at 30,982 tons, against 38,611 tons at the corresponding period last year. Quotations (Wednesday 5 p.m.): No. 1 standard ribbed smoked sheet, spot and July, 10⅞d.; August-September, 11⅛d.; October-December, 11⅜d. per lb.

SEEDS are dull, with prices unchanged from last week. ANISE.—Spanish is 67s. 6d. and Russian 28s. 6d. per cwt. on the spot. CANARY.—Mazagan remains at 23s. 6d. per cwt. on the spot, and for new crop sellers are now quoting 22s. per cwt. c.i.f. for July-August shipment. Saffi is unchanged at 23s. per cwt. spot. CARAWAY.—Dutch is 42s. 6d. per cwt. on the spot, with little or no demand.—CUMIN.—Malta is 55s. on the spot, with a little business passing, while Morocco on spot is very firm at 49s. per cwt. New crop for July-August shipment is 47s. c.i.f. CORIANDER.—It is reported that business has been done on spot at 11s. 6d. per cwt. for five to ten-ton lots. The c.i.f. market is a little firmer, with sellers offering at 9s. 9d. c.i.f. for July-August shipment only. FENUGREEK.—There is none to be had on spot until the June-July shipments arrive. The July-August position is very firm at 15s. 6d. c.i.f. LINSEED is 22s. per cwt. spot, and for new crop the price is 18s. 6d. c.i.f. FENNEL is quiet on spot at 68s., and for prompt shipment the price remains at 62s. c.i.f. MUSTARD.—English remains at from 27s. to 31s. per cwt. on the spot, according to quality.

SENEGA.—In view of the proximity of new crop the spot price has been reduced to 4s. 10d. per lb. New crop for July shipment is quoted at 4s. 4d. c.i.f., and July-August shipment at 4s. 2d. c.i.f.

SHELLAC is rather firmer, usual standard TN orange quality offering at 197s. 6d. per cwt. on the spot; fine orange is 210s. to 300s., pure button 235s., and AC cakey 205s. To arrive, sales of TN for June-July shipment have been made at 183s. 6d. c.i.f., with further sellers at 184s. c.i.f. For delivery, sales include August at 195s. to 192s. 6d. to 197s., October 199s. to 196s. to 200s., and December at 198s. to 201s.

SQUILL.—Spot prices are cheaper at from 37s. 6d. to 40s. per cwt., and for new crop from 22s. 6d. to 25s. c.i.f. is quoted.

TRAGACANTH.—The better grades have been in demand, and although the present stock appears ample, most of it consists of middling and inferior grades. There is a scarcity of gum between £16 and £26, and several orders on the market have not been executed. New crop is not expected before September-October. Quotations are: No. 1, £29 to £30 per cwt.; seconds, £24 to £27; thirds, £19 to £23; fourths, £14 to £18; good thin Persian leaf, £10 to £13; red to yellowish, £7 to £9 10s.; brown and reds, £5 to £7; hoggy, 75s. to 85s. per cwt.

TURMERIC is steady at 34s. to 35s. per cwt. for fair Madras finger on the spot, and to arrive 30s. c.i.f. is quoted.

WAX (BEES).—With fair supplies and quiet demand prices are easy. Benguela and Abyssinian are offered at £7 12s. 6d. to £7 15s., East African at £7 12s. 6d., and Madagascar £7 15s; Jamaica £7 10s., and bleached Calcutta £9 15s. to £10 per cwt.

WAX (VEGETABLE).—*Carnauba* is quiet. Fatty grey is 112s. spot, 110s. c.i.f. afloat, and 107s. c.i.f.; chalky is 114s. spot, 111s. c.i.f. afloat, and 105s. c.i.f. Prime yellow on spot is 170s. to 175s.; Mediana 150s. spot and 142s. 6d. per cwt. c.i.f. *Japanese* is dull at 82s. per cwt. on the spot, and for July-August shipment 73s. c.i.f. is quoted.

Essential Oils

THE market has been rather dull and business on the patchy side. Prices generally remain unchanged since last week. Sicilian oils are inclined to be firm. Otto of rose crop is finished and prices paid for petals have been higher than last season. The average yield has been the same and highest grade is quoted 110s. per oz. Geraniums are worth attention and prices may go higher. Spot supplies of star anise are difficult to obtain.

ANISE (STAR).—There are still no offers for shipment and spot supplies are difficult to obtain. On the spot, drums quoted 2s. 7d., tins in cases 2s. 10d., and leads 3s. per lb.; 2s. 9½d. c.i.f.

BAY is firmer at 8s. per lb. spot.

BERGAMOT seems to be quite out of favour at present. Prices are about the same as last week, 16s. 3d. to 16s. 6d. spot; 16s. 5d. c.i.f.

CASSIA is unchanged at 4s. 10d. per lb.

CITRONELLA.—Java citronella is quoted at 2s. 5d. spot.

GERANIUM is firm and likely to go higher, and Algerian reports are rather gloomy. Spot price ranges from 21s. to 22s. Bourbon is quoted spot at 20s. 6d., and forward at 19s. 9d. to 20s. c.i.f.

GINGERGRASS is quoted on the spot at 8s. 9d. per lb., with shipment quoted 8s. c.i.f.

JUNIPER BERRY is quoted 5s. 6d. per lb. on the spot.

LEMON.—Sicilian is firmer and is quoted on the spot at 15s. 9d. to 16s. For a leading brand 16s. 5d. c.i.f. was quoted by cable on Wednesday.

LEMONGRASS is unchanged at 2s. 9d. per lb. on the spot and 2s. 7½d. c.i.f.

MANDARIN is quoted 26s. per lb. on the spot and 26s. 11d. c.i.f.

ORANGE.—West Indian is easier at 16s. spot and to come forward at 15s. per lb. c.i.f. Sicilian varies according to brand, 17s. 3d. to 18s. 6d. per lb., and 17s. to 18s. c.i.f.

PATCHOULI is quoted at 19s. per lb. on the spot for Singapore and 20s. 6d. per lb. c.i.f. for Seychelles.

PEPPERMINT.—American natural tin oil is quiet at 12s. 3d. to 12s. 9d. per lb. c.i.f., while drums are quoted 12s. 3d. spot, and tins 12s. 6d. to 12s. 9d. per lb., H.G.H. 17s. 6d. per lb spot and 17s. c.i.f. Japanese dementholised is quoted from 6s. 4½d. to 6s. 6d. spot for Kobayashi-Suzuki; 6s. c.i.f.

SASSAFRAS is unchanged at 3s. 10d. per lb. c.i.f. and 4s. 3d. spot.

WORMSEED is unchanged at 7s. 9d. per lb. c.i.f. and 9s. on the spot.

Pharmaceutical Chemicals, etc.

THE expected advances in spot values for phenacetin, phenazone and amidopyrin have taken place, bringing these items up to high levels. Bismuth salts have been reduced owing to outside competition by a new Continental maker; metal is unchanged. Citric acid seems to be in weak hands on spot, and prices are easier. Sulphonal and methyl sulphonal are slightly dearer.

ACETANILIDE remains quiet, with B.P. crystals and powder at 1s. 5d. to 1s. 6d. per lb., as to quantity.

AMIDOPYRIN.—Prices show a considerable advance: spot, ten-cwt., 10s. 7d.; two-cwt., 10s. 11d.; small parcels, 11s. 1d. per lb.; f.o.b. Continent, ten-cwt., 10s. 6d.; five-cwt., 10s. 8d. per lb.

ASPIRIN.—British makers' prices remain firm at from 2s. 6d. to 2s. 8d. per lb., delivered U.K., according to quantity.

BARBITONE.—There is nothing to add to our recent reports: spot is offering at about 6s. 3d. to 6s. 6d. per lb., but there is much less available in dealers' hands. Continental makers are not quoting.

BENZALDEHYDE (.03) is unchanged on a quiet market: quantities, 1s. 10d.; small lots, up to 2s. per lb.

BENZOIC ACID (B.P.) is very steady, with fair business passing; quantities, 2s. 1d., ex works; spot parcels, 2s. 2d. to 2s. 3d. per lb., ex store.

BISMUTH SALTS.—The makers announce a reduction of from 6d. to 1s. per lb. from July 1. The following are the new prices:—

—	Under one cwt.	Not less than one cwt.
	per lb. s. d.	per lb. s. d.
Bismuth carbonate	9 0	8 9
,, citrate	8 6	8 3
,, nitrate cryst.	5 6	5 3
,, oxide	11 6	11 3
,, salicylate	8 6	8 3
,, subchloride	10 6	10 3
,, subgallate	7 6	7 3
,, subnitrate	7 9	7 6

A rebate of 3d. per lb. is given on two-cwt. contracts completed within three months.

BROMIDES are unchanged and business has been moderate. Dealers quote: ammonium, 1s. 10½d. to 1s. 11d.; potassium, B.P. crystals, 1s. 7¼d. to 1s. 7¾d.; granular, 1s. 6¾d. to 1s. 7¼d.; sodium, B.P., 1s. 9½d. to 1s. 10d. per lb., as to quantity. British makers' list prices: ammonium, 1s. 11½d.; potassium, B.P. crystals, 1s. 8¼d.; granular, 1s. 7¾d.; sodium, B.P., 1s. 10½d. per lb., in cwt. lots.

CALCIUM LACTATE is very steady, with a fair demand: quoted from 1s. 2¼d. to 1s. 3½d. per lb., as to quantity.

CHLORAL HYDRATE is steady but quiet: duty-paid crystals, 3s. 1d. to 3s. 3d. per lb., as to quantity.

CITRIC ACID (B.P. crystals).—There still seems to be plenty of foreign on the spot in rather weak hands, and, as a result, prices are easier at about 2s. 0¾d. to 2s. 1d. per lb., less 5 per cent., as to quantity.

CREAM OF TARTAR has met with a fair demand, with prices for foreign 99 to 100 per cent. powder unchanged at about 96s. to 97s. 6d. per cwt., less 2½ per cent.

EPSOM SALT remains quiet: commercial quality, in single bags, £4 5s.; B.P. quality, about £2 per ton more, ex store.

GUAIACOL CARBONATE is steady at about 5s. 3d. per lb., with the market tending to advance.

HYDROQUINONE is steady, with a moderate business passing: quoted from 3s. 8d. for five-cwt. lots up to 3s. 11d. per lb for 14-lb. parcels.

LACTIC ACID.—Convention prices for B.P. continue as reported last week: five-ton lots, 1s. 6d.; one ton, 1s. 6½d.; ten cwt., 1s. 7½d.; two cwt., 1s. 8½d.; one cwt. or less, 1s. 10½d. per lb., in carboys.

METHYL SALICYLATE (B.P.) continues in fair demand, with prices quoted by home makers unchanged at 1s. 6d. to 1s. 8d. per lb., as to quantity.

METHYL SULPHONAL has advanced on the week, with prices for two-cwt. lots, 12s. 7d.; one cwt., 13s.; 56 lb., 13s. 5d.; small parcels, 13s. 10d. per lb.

PARAFORMALDEHYDE is steady on a quiet market: quantities of 100 per cent. powder, 1s. 8d., in kegs; small parcels, 1s. 9d. per lb.

PARALDEHYDE remains quiet: quoted from 1s. 1d. to 1s. 4d. per lb., as to quantity and packing.

PHENACETIN.—This market shows a considerable advance in prices, which was anticipated in this report for the last two or three weeks. Spot: ton lots, 3s. 2d.; ten cwt., 3s. 2½d.; five cwt., 3s. 3d.; one cwt., 3s. 6d.; 56 lb., 3s. 7d.; 28 lb., 3s. 8d.; smaller lots, 3s. 9d. per lb. F.o.b. Continent prices: ten-cwt., 3s. 1½d.; five cwt., 3s. 2½d.; two cwt., 3s. 3d.; less than two cwt., 3s. 4d. per lb.

PHENAZONE.—The advance in prices anticipated in this report has taken place and values on spot and f.o.b. are as follows: spot, ten cwt., 5s. 9d.; five cwt., 5s. 10d.; two cwt., 6s.; less than two cwt., 6s. 1d. per lb. F.o.b. Continent: ten cwt., 5s. 8d.; five cwt., 5s. 9d.; two cwt., 5s. 11d.; less than two cwt., 6s. per lb.

PHENOLPHTHALEIN is unchanged on a quiet market: quoted from 5s. 11d. to 6s. 1½d. per lb., as to quantity.

POTASSIUM PERMANGANATE (B.P.) remains quiet at 6d. per lb. for quantities, in drums, and 6½d. for small lots.

POTASSIUM SULPHOGUAIACOLATE continues firm on spot at about 4s. 3d. per lb.

SALICYLIC ACID (B.P.).—Home makers' prices are unchanged: 1s. 5d. to 1s. 7d. per lb., as to quantity. Little business is passing, but no sign of weakness is apparent in acid, any more than in salicylates in general.

SODIUM DIETHYLBARBITURATE is very firm at from about 7s. 9d. to 8s. per lb. spot.

SODIUM SALICYLATE (B.P.) continues steady, with home makers holding the market: powder, 2s. 2d. for ten-cwt. lots up to 2s. 4d. per lb. for small parcels. Dealers quote: crystals, 2s. 6½d.; powder, 2s. 4½d. per lb., in cwt. lots.

SULPHONAL.—Prices show a further slight advance: two-cwt. lots of crystals, 10s. 1d.; one cwt., 10s. 6d.; 56 lb., 10s. 8d.; small lots, 11s. 2d.; powder, ½d. per lb. more.

TANNIC ACID.—B.P. *leviss* is unchanged on a quiet market: quantities, 2s. 10d.; small parcels, 3s. per lb.

TARTARIC ACID (B.P. crystals).—A fair business continues, but there is no sign of shortage of supplies on spot: the market is steady at 1s. 4d. to 1s. 4½d. per lb., less 5 per cent.

THYMOL is steady but quiet: synthetic fine white, 9s. 1d. to 9s. 3d.; ex ajowan seed, 11s. 3d. per lb.

VANILLIN continues very competitive: ex guaiacol is being offered at very cheap prices for quantities; ordinary-sized lots, about 14s. 6d.; ex clove oil from British makers is about 17s. per lb., in minimum quantities of one cwt.; a fair business is passing.

Industrial Chemicals, etc.

London, July 3

RATHER quiet markets continue to be reported, but the general tone is steady. Formaldehyde remains unsteady, and caustic potash shows no further change; chlorates are still slow of sale. ACETIC ACID is moving in fair quantities, with prices steady: 80 per cent. technical, £36 15s.; 80 per cent. pure, £37 per ton, in barrels; glacial, pharmaceutical, 99 to 100 per cent., £66, in glass demijohns; glacial, in barrels, £56 per ton, ex store. ACETONE is unchanged, with dealers and home makers quoting level figures: B.G.S., £76 to £85 per ton, in drums, ex store. AMMONIUM CHLORIDE is rather slow, but dealers' prices for grey galvanising are steady at £21 5s. to £21 10s. per ton, in casks, ex store; slightly less for contracts. ARSENIC.—Demand has been dull, but Cornish agents do not seem inclined to shade £15 per ton f.o.r. mines, and some, in fact, are asking a little more. Mexican high-grade is quoted £16 10s. c.i.f. Liverpool. BARIUM CHLORIDE is a good market, with supplies limited: 98 to 100 per cent. prime white crystals, £11 10s. per ton, in casks, ex store; forward, £10 5s., f.o.b. Continent. COPPER SULPHATE.—There continues to be a wide margin between the prices quoted by British makers and those for parcels offering from the Continent. The former are still quoting at £28 for casks f.o.b., less 5 per cent., whereas Continental offers are being made down to £24 10s. f.o.b. FORMALDEHYDE continues very competitive, with quoted prices about £35 per ton for 40 per cent. by volume, in casks, ex store; less would be taken for large quantities. FORMIC ACID is slow of sale, with the quoted price of 85 per cent. easy at £44 10s. to £45 per ton, in carboys, ex store. ISOPROPYL ALCOHOL is steady, with a limited business moving: reliable material, 11s. to 12s. per gallon, in drums, carriage paid. OXALIC ACID is steady but quiet: quantities, from £30 per ton, ex wharf; spot parcels, from 32s. per cwt., ex store. CAUSTIC POTASH.—Convention prices continue at the reduction reported last week; c.i.f., 30s. per ton less. POTASSIUM CARBONATE is steady but still slow of sale: 90 to 92 per cent., £24 7s. 6d. to £24 10s.; 96 to 98 per cent., £25 10s. per ton, in casks, ex store; slightly less for contracts. POTASSIUM CHLORATE remains dull: quantities to arrive, 2⅞d. per lb., ex wharf; spot parcels, 3d. to 3½d. per lb., ex store. POTASSIUM PERMANGANATE is dull, but the market is very steady and may advance a point or so: quantities, in two-cwt. drums, 5½d. per lb., ex store. SODIUM ACETATE is firm, with supplies short on spot: quoted at £21 10s. per ton, in casks, ex store; forward position is also firm. SODIUM HYPOSULPHITE is steady and business has been fair: dealers quote pea crystals, in one-cwt. kegs, £15; commercial quality, £9 10s. per ton, in casks, ex store. British makers' price for pea crystals to home consumers on contract, £15 per ton, carriage paid to buyer's station. SODIUM PRUSSIATE has been showing a little more life: quantities, 4¾d. to 5d. per lb.; small parcels, 5¼d. to 5½d., ex store. SULPHUR.—Business in American crude is not very active and quotations stand at £5 12s. 6d. to £5 17s. 6d. per ton. Sicilian flowers sell at £12 7s. 6d., refined ground at £11, and roll at £9 15s., all c.i.f. to arrive. COAL-TAR PRODUCTS, ETC.—Pitch continues to advance, with the market closing steady; other items are unchanged, with the market quiet. CARBOLIC ACID ICE CRYSTALS (39° to 40° C.) remain firm at 7d. to 7½d. per lb. for bulk quantities. Manufacturers are heavily committed at the present time, and it is practically impossible to obtain early delivery of any large parcels. Bulk business cannot be done earlier than October-December, and even later positions are being booked. CRESYLIC ACID.—Pale and refined grades are in fairly brisk demand, the former being priced at about 2s. to 2s. 2d. per gallon, naked at works, in bulk quantities. Refined remains firm at about 2s. 9d. per gallon.

Fixed Oils, etc.

PALM OILS show a good advance, with the market steady. Linseed oil and American turpentine are also higher on the week, closing firm. Cotton oils close firm at improved prices; ground nut and palm kernel oil are steadier. ACID OILS are steadier, with business fair: coconut and/or palm kernel, 31s.; ground nut, 30s. 6d.; soya, 27s. 6d. spot. CASTOR.—Prices show a slight advance; market is steady: pharmaceutical, 50s.; first pressings, 45s.; second pressings, 42s. per cwt. on the spot, in not less than one-ton lots. COCONUT has been dull: deodorised, spot, 37s. 3d.; Ceylon, 33s. c.i.f.; Cochin, 42s. c.i.f. COTTON shows an improvement and closes firm at higher prices: deodorised, 38s.; common edible, 36s.; soapmaking, 34s.; crude, 31s. 6d. spot. GROUND NUT is steady as quoted: deodorised, spot, 40s.; crude Oriental, 35s. 6d. c.i.f. PALM KERNEL is steady: deodorised, 37s. 9d.; crude, 33s. 6d. spot. PALM.—Prices for all grades have advanced, with the market showing a little more life: Lagos, 33s. 6d.; softs, 32s. 9d.; mediums, 33s. 6d.; hards, 35s. 3d.; bleached, 35s. 6d. spot. RAPE is quiet: refined, 46s.; crude, 44s. spot. SOYA remains quiet but steady: deodorised, 37s.; crude, 33s. spot. LINSEED (raw, naked).—With advance in seed prices the market has moved in sympathy and closes firm. On spot, 32s.; July, 30s. 9d.; July-August, 30s. 7½d.; September-December, 30s. 7½d.; January-April, 30s. 9d. Boiled oil, spot, 35s. TURPENTINE has been rather firmer, in sympathy with American advices, and reports that the general trade demand has been quite good. London deliveries for last week were 1,821 barrels, making a total since January 1 of 49,282 barrels, which compares with 54,944 barrels for the same period last year. Stocks were reduced to 8,172 barrels. Including the landings and afloats, the London visible supply made up at 17,968 barrels, against 28,619 barrels at the same date last year. The London spot prices closes at 44s. 9d., July 43s. 6d., August-December 42s. 3d. per cwt.

Correspondence

Letters for this section should be written on one side of the paper only. Correspondents may adopt an assumed name for purposes of publication, but must in all cases furnish their real name and address to the Editor.

Easy Prescribing

SIR,—A prescription recently brought to my pharmacy reads :—

Tabloid mixed gland (female), No. 2.

One to be taken in a little water twice daily.

Byno hypophosphates ʒvj.

Two teaspoonsful to be taken in a little water and gradually increased, before each meal. [To be increased to what amount?]

Taxol (one small bottle).

One or two tablets when constipation troubles.

Tabloid tri. brom. effervese.

Two to be taken in half a tumbler of water after food and three at bedtime.

Byno hypophosphites is put up in an 8 oz. size; what about the 2 oz. left over? The tabloids and taxol being original (unbroken) packages, the retail price is to be charged—no dispensing fee. Now, what about the time in copying in prescription-book, writing labels, paper, envelopes, etc., and a qualified pharmacist (assistant) to dispense the same? The effervescing tabloids had to be obtained from a fellow pharmacist (that helped considerably), but what about errand boy's time, cycle, etc.? Is such dispensing what I pay a qualified assistant for?

Yours faithfully,

HOVA CIVITAS (28/6).

Concerted Action

SIR,—The action of the Hove chemists with regard to a sixpenny line offered through a bazaar (*C. & D.*, June 22, p. 767) is one which should be an example to all retail chemists, who find that after they have made a sale for these lines the manufacturers offer them to this type of stores, with the result that the chemists lose the goodwill in the commodities they have succeeded in marketing by their own efforts. Concerted action of this nature all over the country would soon bring about a change in this policy; for there is no doubt that the public do take up lines on the chemist's recommendation. One would have thought that the makers themselves would be more far-sighted, for these big concerns in time develop their own supply centres and become self-contained, so that ultimately the wholesaler may be wiped out as well as the small retailer. A similar short-sightedness also affects those manufacturers who allow their goods to be cut in price without taking adequate steps to prevent it. This was brought home to me recently by a customer who inquired for a line which has been cut to cost, and on informing her that I had ceased stocking it she exclaimed that she seemed to be unable to get it anywhere; I had to explain that the price had been gradually reduced to cost, or a little below, and it was not worth while selling it, so that in this instance all three parties suffered—the manufacturer, the retailer, and the consumer.

Yours, etc.,

THIRD PARTY (1/7).

SIR,—The chief point which chemists complain of is not so much that large concerns can buy proprietaries on better terms than the small man, but that the manufacturers make use of the chemist in a single business largely to market their products, and having obtained a demand offer their best terms to other traders unconnected with pharmacy and not to the men who have made the original sales. It stands to reason that a company owning many shops can place an order running into £100 or more for one proprietary line and can almost demand an extra discount for purchasing in these large quantities; very few manufacturers would feel inclined to refuse such an order, and the small man who can only order a £2 or £5 parcel cannot hope to get preferential terms; naturally, if a concern is big enough to run its own distributing centres it scoops the wholesaler's profits as well as the retailer's. If this kind of thing were confined to businesses run in conformity with the Pharmacy Acts there would perhaps be not so much to complain about; but when it is extended to stores and bazaars which make no pretence of being other than cheap markets we have good cause to grumble. But is it not a fact that chemists have the remedy in their own hands if they would only adopt it by taking a really united course of action? Pharmacists could do three things—first, refuse to take up any new proprietary line of any kind unless there was a definite guarantee from the proprietor that it would never be offered to firms outside the drug trade; second, work together in a system of co-operative buying in order to purchase larger parcels; and, third, refuse to stock or sell any line which was put up in small packs to cater for the bazaar trade. Surely the weight of the 6,000 or so retail chemists' shops in the country in combined action would have a greater pull than the stores, and would compel the manufacturers to think twice.—Faithfully yours,

SIX MILLE (17/6).

Legal Queries

G. M. B. (26/86).—If the Washington Convention is ratified and put into force in this country how will it affect the hours of shop assistants? [It will not apply to shop assistants.]

R. J. T. (24/86) has employed an errand-boy for the past three years, who works from 9 a.m. to 8 p.m., and sometimes until 9.30 p.m. Is he entitled to a fortnight's holiday? [An employee has no legal right to a holiday in the absence of an agreement to that effect, or unless he is employed at a holiday resort and in pursuance of an Order made by the local authority under the Shops Acts he forfeits his weekly half-holiday or works "extra hours" during the "season."]

Miscellaneous Inquiries

When samples are sent particulars should be supplied to us as to their origin, what they are, what they are used for, and how. We do not undertake to analyse and report upon proprietary articles nor to publish supposed formulas for them.

J. F. S. (11/68).—ANTS ON LAWN.—The chemicals applied to the lawn to kill the ants would also kill the grass, so that the best way is to trap them.

F. A. L. (7/6).—TABLE CLEANER. — This is a highly coloured purple-violet paste smelling strongly of kerosene and probably containing also a little turpentine. The base is paraffin wax.

Retrospect of Fifty Years Ago

Reprinted from "The Chemist and Druggist," July 15, 1879

Unqualified Vendors of Poisons

Mr. Hampson moved [at a Council meeting of the Pharmaceutical Society] that the General Purposes Committee should take into consideration the largely increasing sale of "patent medicines" containing scheduled poisons, by grocers, general dealers, and other unregistered persons, and report thereon, more especially with regard to the advisability of endeavouring to restrict the sale of such "patent medicines" to persons registered under the Pharmacy Act of 1868. He said that the sale of poisons under cover of the patent-medicine stamp was a growing evil. He heard the other day of a grocer's assistant who said the dose of chlorodyne was a teaspoonful. In the country, he was told, wholesale houses supplied 2-oz. bottles of laudanum by the gross with the stamp on, and opium was also sold in the same way. Tincture of aconite was sold by grocers with a stamp, and there was nothing to prevent hydrocyanic acid being put up in the same way. . . . Ultimately the proposal was agreed to.

THE CHEMIST AND DRUGGIST

COMMERCIAL COMPENDIUM

deals with the trade side of pharmacy

[Commenced *C. & D.*, July 5, 1924]

Resins, Synthetic.—There are a number of substances which can be made to form non-crystalline resinous bodies, either by means of polymerisation or by interaction and condensation with another substance. Such products have a considerable commercial interest, despite the fact that the chemistry of these processes is not very fully understood. The chief examples are the resinous bodies resulting from the condensation of phenols with aldehydes. The resinous body formed by condensation of formaldehyde with a phenolic body is known as a formaldehyde-phenolic resin. About 12,000,000 lb. of synthetic resins were produced in America in 1924 for use as electrical insulation material, as varnish, and for radio and automobile parts. The largest use of phenol in America is for the purpose of manufacturing synthetic phenolic resins. The French output is about one-fifth that of American, and one-third part of the German. The British manufacture is probably between these two, and is growing rapidly. Another product which is gaining interest in commercial circles is the condensation product of urea, or its derivatives, with formaldehyde These products bear such names as soluble and flexible glass, beetle resins, etc. Resin soluble in turpentine and drying oils may be produced from hydrocarbons by reaction with formaldehyde under the influence of a strong polymerising agent. The varnish manufacturer turns to yet another group of synthetic resins, namely, the polymerisation products of naphtha distillates containing indene and coumarine, and known as coumarine resins. In France a polymerisation resin derived from acrolein, under the style of Orca, is being developed for electrical insulation purposes. Another class consists of "treated resins," produced by suitable modifying processes from natural resins. Such are resin hardened by treatment with lime, or natural resins esterified by treatment with glycerol, etc. Synthetic resins, though possessing valuable properties, only show advantages over the natural resins in certain specific directions. The formaldehyde-phenol resins, in particular, show disadvantages in the lack of uniformity of successive batches, but these troubles are being overcome and manufacturers are now selling to a standard. Perhaps the chief reason why the varnish industry has been slow to adopt the synthetic resins is that difficulty has been experienced in the incorporation of the majority of resins with the drying oils, especially in the case of the formaldehyde phenolic resins, which normally are soluble only in alcohol. This has limited their use to spirit varnishes and lacquers, in which spheres they have become serious rivals to shellac. Modern research is directed to the production of formaldehyde condensation products soluble in benzene, turpentine and fatty drying oils. Coumarine resins are oil-soluble, but difficulties, which are now mainly conquered, have been experienced as to standardisation of the batches, with the result that these resins are competing with resin ester in varnish manufacture. Of the condensation resins, the chief is that made from formaldehyde and phenolic compounds. Bakelite is a typical example. Other similar trade products are :—Redmanol, Elo, Bakelaque, Melusite, Condensite, Amberite, Phenoform, Sibolite, Amberdeen, Formite, Issolin, Resan, Novolak, etc. Roughly the manufacturing process is as follows :—Phenol and a solution of formaldehyde in suitable proportions are put in a steam-jacketed kettle and heat is gradually applied. Suitable catalysts are then introduced. Reaction soon starts with evolution of heat to such an extent that steam has at times to be shut off and cold water circulated to control the process. After a few hours the contents of the kettle will be separated into two layers, the heavy condensation syrup below and the water above. After removal of the water, the viscous syrup is further heated in order to drive off more water. The resulting syrup is transparent and is run off into shallow pans to cool, when a solid resin, soluble in alcohol, forms. Any variation in certain conditions will produce a resin of different character. The phenolic bodies are used either in the crude or the pure state, whilst the formaldehyde is used either in its common liquid forty per cent. form or in its polymerised form, as the dry powdered paraformaldehyde. The catalyst is either of acidic or basic character, although condensation can be effected without the use of a catalyst. Coumarine resins are obtained by treating certain distillates from coal-tar naphtha. The fraction of "solvent naphtha," which boils between 150° and 200°, is polymerised as regards certain constituents with sulphuric acid or certain other acids. Stern has quickened the process of resinification of coumarine oil by the use of catalysers which facilitate oxidation. He made use of lead resinate and other metallic resinates or linoleates, the polymerisation and oxidation of coumarine proceeding in a manner which is not properly understood. The polymerising constituents are mainly indene and coumarine. Methyl homologues of coumarine and indene are found in the naphtha distillate, which may be resinified in a similar way. Commercial coumarine resin is manufactured as follows:—After fractionating crude coal-tar naphtha, the fraction boiling between 160° and 183° is collected for the polymerisation. The naphtha as distilled must be dried with sulphuric acid. Three to five gallons of sulphuric acid of specific gravity 1.7 may be used to dry 1,000 gallons of naphtha. After correct rectification, naphtha should yield from 25 to 40 per cent. of polymerisable material. When the proportion is as high as 30 per cent. considerable heat is generated during the reaction, and efficient cooling is necessary. The light-coloured resins are produced by quick reaction, and for this purpose rapid dissipation of the heat is essential. The maximum temperature should be 20°. The Barrett Co. have protected a method of cooling in which the reaction mixture of naphtha and polymerising agent is either emulsified by passing between surfaces spaced from .005 to .100 inches apart, and moving with a relative velocity of more than fifty feet per second, or is passed quickly through an agitating device to disperse one constituent in a finely divided condition in the other. The polymerisation or condensation of aldehydes alone yields resins, some of which are entering into industry. Resins from acrolein have been particularly examined by Moureu and Dufraisse, who worked out methods of cheap production and complete stabilisation of this aldehyde. This cheap acrolein provides the raw material for resins such as that, previously mentioned, known as Orca. Pure acrolein is polymerised in the cold by means of inorganic and organic bases or salts of iron or lead. A voluminous white precipitate is obtained by the addition of one per cent. of a basic catalyst to an aqueous solution of acrolein. If this filtered quickly, washed and dried *in vacuo*, a smooth white powder melting between 80° and 100° results. This is insoluble in water and hydrocarbons, but soluble in most other organic solvents. Acrolein also condenses with phenols to form hard resins in the presence of about one per cent. of caustic soda. The reaction is simple, and is claimed to give a hundred per cent. yield. The acrolein resin contracts very slowly by about one quarter, and the gel attains insulating properties of the degree of amber.

Regulus.— A name given since the sixteenth century to an intermediate product in the smelting or reduction of metallic ores, and still used to indicate the more or less pure part of a metallic substance which arises from melting the ore. It is a term freely used for smelted antimony or the metal obtained from antimony ore and crude antimony, which contains at least 99 per cent. of pure antimony. Copper smelters also use the term "regulus" or "copper precipitate," which means virtually the same thing as for antimony. The O.E.D. suggests that it was originally applied to antimony, apparently because of its readily combining with gold. The word is a diminutive of "rex." Regulus is also the name of a star, which may account for the name "star regulus antimony" for a high-grade brand.

The C.&D. Commercial Compendium

Rennet.—The chemistry of the coagulation of milk in the mammalian stomach is still obscure. In commerce the term "rennet" or "essence of rennet" is applied to a liquid obtained by digesting the membrane of calf's stomach with hydrochloric acid of 0.1—0.2-per-cent. strength, or with an aqueous solution of glycerin or salicylic acid. The word is found in the English language from the fifteenth century onwards. *Rennin* is regarded as the specific enzyme of rennet: its relation to pepsin is not understood. Rennet converts the caseinogen of milk into casein in the presence of calcium salts, and is commercially used in the production of cheese and junket. The time required for the completion of the action is determined by the degree of concentration of milk and enzyme, acidity, and temperature. The optimal temperature is between 37° and 45° C.

Rennin.—*See* Rennet.

Repairs.—Generally speaking, neither the landlord nor the tenant of premises is responsible for repairs in the absence of an agreement to that effect; consequently, the extent of the liability of each for repairs is usually defined in the lease or tenancy agreement. However, even in the absence of an agreement, a tenant is under an implied obligation to make good any damage that he may do to the premises during the period of his occupancy. By statute, landlords of houses let for habitation by the working classes are bound to put them in a condition that makes them "reasonably fit for human habitation."

Repercolation.—The British Pharmacopœia prescribes in Appendix IX the division of a drug into five equal parts for the purposes of the repercolation process. The percolate from the first of these parts (*see* Percolation) is collected in five "fractions," each of which is passed successively through the other four parts of the drug. In the case of a standardised preparation, an adjustment to a definite alkaloidal strength is made after the fractions have been mixed. The object of repercolation is to obviate waste of menstruum and possible changes arising from the heat applied during evaporation of superfluous liquid.

Replevin.—Proceedings for recovery of possession of goods seized by a landlord or a creditor under a distress or execution.

Residuary Legatee.—The person to whom is bequeathed the property of a testator remaining after the specific bequests have been provided for.

Respirators.—This term is used in more than one sense, but is generally employed to denote a device of gauze or wire, covering the mouth, nose, or both, which serves to prevent the inhalation of dust, smoke, or other noxious substances. Other uses of the word include various types of rescue apparatus such as are used in mines or for diving outfits. In medicine the term "mask" has come to be practically synonymous with that of respirator, especially with regard to appliances for the administration of chloroform, nitrous oxide, oxygen, etc. Respirators were habitually worn by troops during the European war to minimise risk of poisoning from gas, and these so-called gas-masks could be worn for several hours at a time, all air being drawn through an alkaline oxidising powder, which destroyed the poisonous fumes. Similar appliances are used by firemen and chemical workers when necessary. In former days respirators were much used in diseases of the nose, throat, or lungs for impregnating the inspired air with medicated vapours; for this purpose they were constructed with a chamber containing a sponge or cotton-wool, which was kept charged with the substance selected (e.g., carbolic acid, creosote, eucalyptus oil, etc.). An apparatus for testing the composition of exhaled air is also described as a respirator.

Restrictive Agreement.—An agreement or covenant under which a person is debarred from doing certain acts—for example, entering into competition in trade or business. (*See* Radius Agreement.)

Retail.—The Pharmacy and Poisons Act (Northern Ireland), 1925, gives (Sec. 16) a definition of a wholesale transaction within the area of the country itself, thus throwing, by implication, light on the nature of a retail transaction. The persons entitled to purchase poisons by wholesale are retail chemists (including firms or bodies corporate lawfully carrying on the business of a chemist), registered medical practitioners, dentists, veterinary surgeons, persons licensed for the wholesale sale of "dangerous" drugs, Government departments, local authorities, and other persons, firms or bodies corporate requiring any poison for use in a trade or profession, or in connection with a hospital or similar institution. The dividing test thus appears to be, in the case of private people, use in a trade or profession; if no such use is contemplated the sale is not a wholesale one. In the case of a chemist, doctor, dentist, veterinary surgeon or wholesale vendor of "dangerous" drugs, the purpose for which a poison is required is not mentioned in the Section. In Great Britain, the Dangerous Drugs and Poisons (Amendment) Act, 1923, Sec. 3, is usually regarded as taking sales of poisons to doctors, dentists and veterinary surgeons out of the category of wholesale transactions. The quantity of poison sold at one time to one customer has apparently no bearing on the distinction between wholesale and retail sales.

Retail Pharmacists' Union.—One effect of the uncertainties affecting the outlook in the industrial position immediately after the Armistice of November 11, 1918, was that the relations of retail chemists to Government departments became difficult to control and even to define. Before long the Pharmaceutical Society of Great Britain found that it was likely to be involved in situations of some difficulty, partly through the work of the Local Associations Executive, which, from time to time, discussed with a Government department the terms regulating the dispensing of National Health Insurance prescriptions, and partly on account of the threatened formation of a Trade Board which was to have included members of the chemists' and other retail trades. The need for a final, or, at any rate, a workable definition of the powers and functions of the Pharmaceutical Society became so urgent that it was decided to seek the aid of the High Court in a friendly action, in which the plaintiff sought to restrain the Society from carrying out certain functions which, he contended, were not within the scope of the powers conferred upon it by its Charter or by statute. While the preliminary steps were being taken to bring the case, now generally referred to as "the test case," to a hearing, a body of chemists in retail business was formed in Scotland with the title of the Scottish Pharmaceutical Federation (q.v.), for the purpose of protecting the business interests of its members. On October 27, 1920, the late Mr. Justice Peterson delivered a reserved judgment, the general effect of which was to make it illegal for the Society to conduct or to promote any matters which could be regarded as belonging solely to the trading side of the chemists' work. Widespread discussion followed, and on December 8 of the same year a conference of local associations' delegates met in London for the purpose of considering a draft scheme for the formation of a trade organisation distinct from the Pharmaceutical Society. The title agreed upon, after discussion, for the new body was "The Retail Pharmacists' Union," and an essential part of the preliminary organisation was the making of working arrangements with the Chemists' Defence Association and the Proprietary Articles Trade Association. The Local Associations Executive was wound up. The membership of the Union is given in a recent report as comprising more than 7,000 shops. A list of the services undertaken by it will be found in the Year-Book of the Proprietary Articles Trade Association. The Executive Committee of the Retail Pharmacists' Union is identical with that of the Chemists' Defence Association, Ltd., and membership of the latter body and of the Proprietary Articles Trade Association (retail section) is compulsory for members of the Union. The secretary of both is Mr. G. A. Mallinson, 4-5 Queen Square, London, W.C.1.

Dental Plate Fixing Powder

Recommended by the Dental Profession.

This powder when sprinkled on the Denture gives immediate adhesion and the maximum amount of comfort.

VISTIC POWDER is hygienic, pleasant and antiseptic.

It gives an agreeable feeling of security to old or new dentures, and enables one to speak with greater confidence.

In handsomely decorated tins with Perforated Tops.

RETAIL 1/- and 1/9 P.A.T.A.

7/- and 13/- per doz. net.

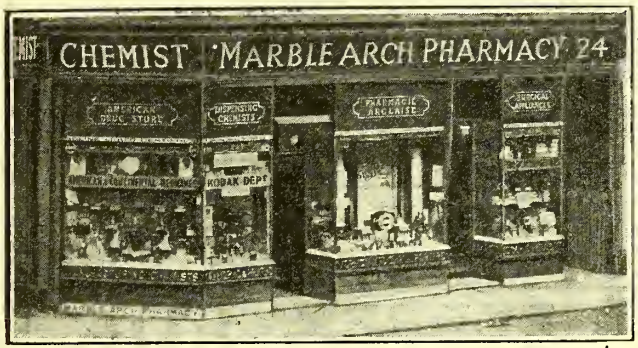
MEGGESON & CO. LTD.

Estab. over 130 years

BERMONDSEY, LONDON, S.E.16

Experience does count

Two more London Chemists testify to remarkable increasing demand for 'ASPRO'



SALES DOUBLED with Current Window Display

T. M. BLACK, *DISPENSING CHEMIST,* 160 Franciscan Road., Tooting, S.W.17

To 'ASPRO' Limited, Trading Estate, SLOUGH, Bucks.

Dear Sirs,—Just a line to let you know how pleased I am with the 'ASPRO' window show you sent me. The result since putting it in has been very marked —my sales have been more than doubled and the increase has been most marked in the 25's size.

There is no doubt in my mind that the policy of the chemist is to devote his window display to lines which are heavily advertised as yours is. It keeps a constant stream of purchasers coming into the shop which can be turned to good account for other lines stocked by us chemists.

Wishing you every success,
Yours faithfully,
THOMAS M. BLACK.

MARBLE ARCH PHARMACY
Proprietors: HYGIENIC STORES, LTD.
ENGLISH & FOREIGN CHEMISTS,
24 EDGWARE ROAD, W.2
Telephone: PADDINGTON 7699.

27th April, 1929.

Dear Sirs,—Permit me to take this opportunity of telling you how satisfied I am with 'ASPRO' sales. I recommend it extensively to all my customers, as indeed do all my four assistants and we have yet to find a dissatisfied customer, or a case in which the desired relief from pain has not been obtained.

Our close proximity to Hyde Park has brought us experience that has taught us that 'ASPRO' is very well recommended for headaches caused by sun-glare, and for the normal day-trippers headache. In fact we confidently recommend 'ASPRO' in all those cases where the use of aspirin is indicated, and particularly in those cases where ordinary aspirin is not well tolerated.

Faithfully yours,
THE MARBLE ARCH PHARMACY.

'Aspro' Bonus System for Chemists gives Extra 17% Profit

Send for special window display and buy 'ASPRO' on exclusive bonus terms for chemists. Order through your Wholesaler. The bonus works out as follows:—

BONUS ON 10's.

One Gross Order -	Bonus 1 dozen packets.
Half Gross Order -	Bonus ½ dozen packets.

Half gross 10's is minimum order accepted for Bonus purposes.

BONUS ON 25's.

One Gross Order -	Bonus 2 dozen packets.
Half Gross Order -	Bonus 1 dozen packets.
Quarter Gross Order	Bonus ½ dozen packets.

Quarter gross is minimum quantity.

NO BONUS ON 5's OR 60's.

CONDITIONS.—The conditions are, that upon receipt of each bonus the chemist undertakes to show 'ASPRO' Display matter in his shop window for 14 days, and to sell at advertised prices. Acceptance of bonus is considered as acceptance of these conditions. To qualify for the bonus it is not necessary for the chemist to buy both sizes at the same time but single lots may be ordered, *viz.*, 6 doz. 10's or 3 doz. 25's.

SOLD IN 3d., 6d., 1/3 and 2/6 sizes with corresponding Wholesale prices of 2/3, 4/6, 11/6 and 21/- per dozen subject to 2½% discount 30 days.

'ASPRO' consists of the purest Acetyl Salicylic Acid that has ever been known to Medical Science and its claims are based on its superiority.

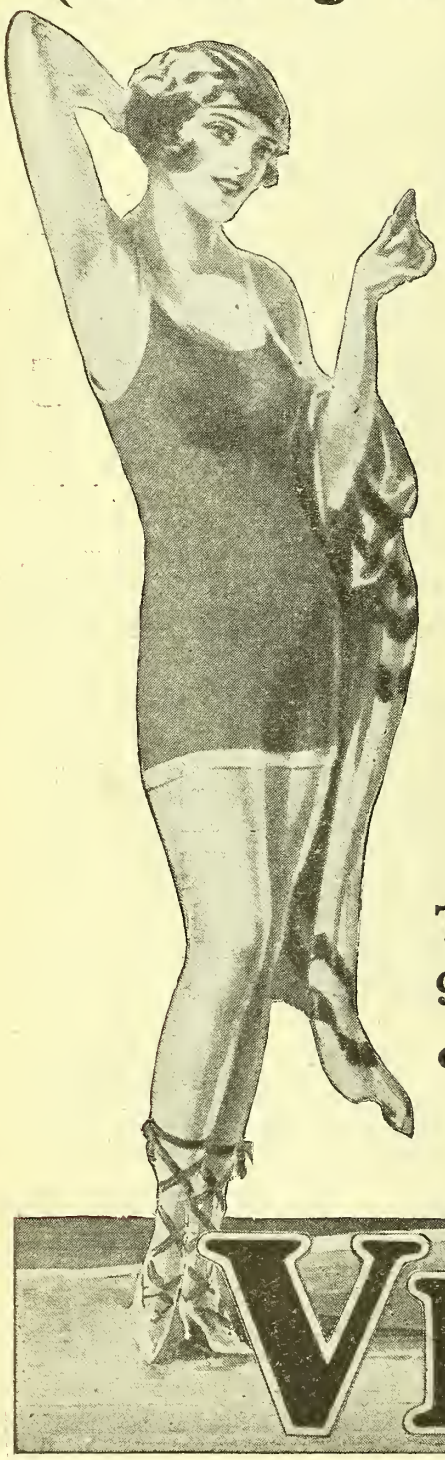
ASPRO REG. TRADE MARK

Agents : **GOLLIN & Co. Pty. Ltd. ('ASPRO' Dept.), Slough, Bucks.**

No proprietary right is claimed in the method of manufacture or the formula. *'Phone : SLOUGH 608.*

Special Discount Offer

(*Bathing and Dancing Season*)



OPEN TILL AUG. 15, 1929

Every customer will be entitled to place *one order* for VEET any time prior to 15th August, 1929, and receive on such order an

Extra Discount of 10%

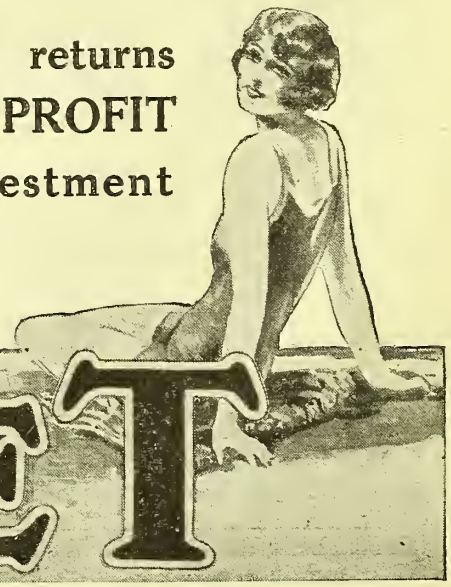
Under this offer VEET may be obtained on the following exceptionally generous terms:

33⅓% Trade Discount.
10% SPECIAL SEASONAL DISCOUNT.
5% Cash Discount.
PLUS ONE FREE TUBE PER DOZ.

One order only from each customer will be executed upon this basis. Orders must be for not less than 3 dozen tubes (either the 1/6 size, the 3/- size, or assorted sizes). The maximum order accepted on this basis will be for £10 at trade prices.
No order will be executed on this extra discount basis if postmarked later than 15th August, 1929.

DAE HEALTH LABORATORIES LTD.
68 Bolsover Street, London, W.1

This OFFER returns 90 per cent. PROFIT on your investment



VEET

A CAUTION

INVEST YOUR MONEY ONLY IN ARTICLES OF KNOWN REPUTATION AND WITH A READY SALE

It is easy to make airy promises of advertising and sales to come, and to urge the laying in of stock to meet a demand yet unborn. We offer you tangible business—

VEET

is "the biggest-selling depilatory"

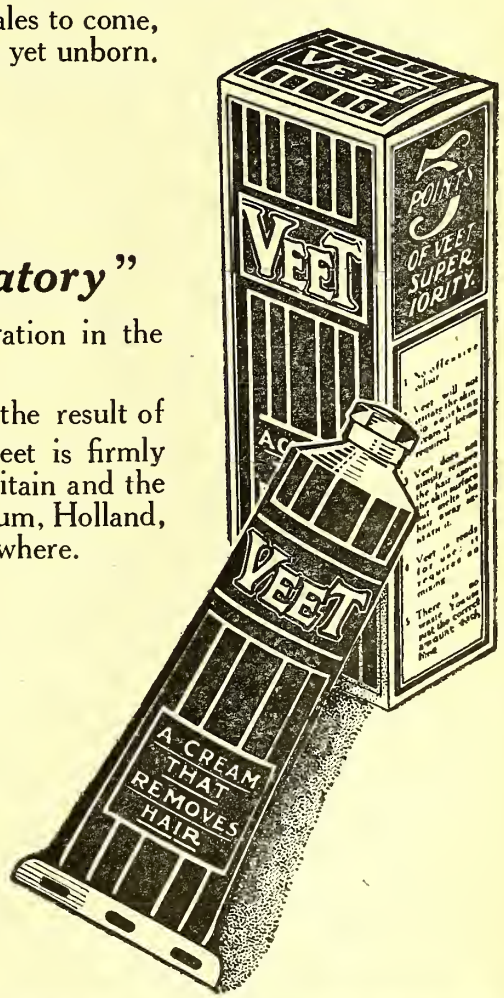
Veet is the most widely used hair-removing preparation in the world and has by far the largest sale.

Veet is a British Product of British quality. As the result of seven years' steady advertising and proven merit Veet is firmly entrenched in the public confidence, not only in Britain and the Empire, but also on the Continent in France, Belgium, Holland, Sweden, Norway, Italy, Spain, in fact nearly everywhere.

Therefore rely on Veet and do not worry about something the public have never heard of. Don't lock up cash and load your shelves with a thing you may never be asked for.

Veet advertising is more abundant than ever.

Veet sales are guaranteed.



SEE SPECIAL SEASONAL DISCOUNT OFFER ON OPPOSITE PAGE

VEET

Glaxo

GLAXO PRODUCTS AND PRICES

	RETAIL	TRADE
GLAXO, Prescription (Humanised). Known as "Sunshine" Glaxo	2/–	19/3 per doz.
GLAXO, Prescription (Humanised). Known as "Sunshine" Glaxo	4/–	38/5 per doz.
GLAXO—Standard Full-cream	1/6	14/5 per doz.
GLAXO—Standard Full-cream	2/6	24/– per doz.
GLAXO—Standard Full-cream	4/6	43/2 per doz.
GLAXO—Standard Full-cream	7/6	72/– per doz.
GLAXO MALTED FOOD ..	1/3	12/– per doz.
GLAXO MALTED FOOD ..	2/4	22/5 per doz.
GLAXO MIXER	2/–	1/7 each.
GLAX-OVO	1/6	14/5 per doz.
GLAX-OVO	3/3	31/2 per doz.
GLAX-OVO	6/–	57/7 per doz.
GLAX-OVO .. (7 lb. tins)	16/6	13/3 per tin.
GLAX-OVO MIXER ..	2/–	1/7 each.
GLAXO BRAND COD-LIVER OIL (Vitamin-Tested)	2/9	24/9 per doz.

"Ostelin"

VITAMIN D PREPARATIONS

	RETAIL	TRADE
"OSTELIN" (Glycerin Suspension) in 8 c.c. phials ..	2/6	22/6 per doz.
"OSTELIN" for Dispensing (in 2, 4, 8 or 16 oz.), per oz.	6/3	9/5 per 2 oz.
"OSTELIN" VETERINARY 1 oz.	4/6	40/6 per doz.
"OSTELIN" AMPOULES 3 in box	3/–	27/– per doz.
"OSTELIN" AMPOULES, 10 in box	8/6	76/6 per doz.
"OSTELIN" ELIXIR, for Dispensing, ½ lb.	5/8	4/3 per bot.
"OSTELIN" ELIXIR for Dispensing .. .. 1 lb.	10/–	7/6 per bot.
"OSTELIN" EMULSION (Cream) .. .. 8 oz.	2/6	22/6 per doz.
"OSTELIN" NASAL SPRAY (OSNOL)	3/–	27/– per doz.
"OSTELIN" TABLETS 45 in bottle	2/6	22/6 per doz.
"OSTELIN" TABLETS for Dispensing 250 in bottle	12/6	9/5 per bot.
"OSTELIN" TABLETS, with PARATHYROID 100 in bottle	8/9	6/7 per bot.
"OSTELIN" TABLETS with PARATHYROID 500 in bottle	40/–	30/– per bot.
OSTOMALT .. .. ½ lb.	2/6	24/– per doz.
OSTOMALT .. .. 1 lb.	4/–	38/5 per doz.

Order through your usual Wholesaler

maltINE

MALTINE PRODUCTS AND PRICES

	RETAIL	TRADE
MALTINE (Plain)	2/3	20/3 per doz.
MALTINE (Plain)	4/–	36/– per doz.
MALTINE (Plain) Hospital size	15/6	11/8 each.
MALTINE with CASCARA SAGRADA	3/–	22/– per doz.
MALTINE with CASCARA SAGRADA	5/6	49/6 per doz.
Hospital size	22/6	16/11 each.
MALTINE with COD-LIVER OIL	2/3	20/3 per doz.
MALTINE with COD-LIVER OIL	4/–	36/– per doz.
Hospital size	15/6	11/8 each.
MALTINE with CREOSOTE	3/–	27/– per doz.
MALTINE with CREOSOTE	5/6	49/6 per doz.
Hospital size	22/6	16/11 each.
MALTINE with PEPSIN and PANCREATIN	3/–	27/– per doz.
MALTINE with PEPSIN and PANCREATIN	5/6	49/6 per doz.
Hospital size	22/6	16/11 each.
MALTO-YERBINE (Liquid)	3/–	27/– per doz.
Hospital size	30/–	22/6 each.

MALTINE is a malt extract of high diastatic power and contains Vitamin B in notable proportion. In combination with cod-liver oil certified to be exceptionally rich in Vitamins A and D, it presents a completely proportioned food of great therapeutic value. MALTO-YERBINE presents MALTINE in conjunction with an active extract of Yerba Santa, thus providing an admirable nutritive and expectorant mixture which contains no opiates.

Glaxo Feeders

GLAXO ACCESSORIES AND PRICES

	RETAIL	TRADE
GLAXO BABY CREAM (in tubes)	1/6	13/6 per doz.
GLAXO BABY POWDER (in tins)	1/–	9/– per doz.
GLAXO BABY SOAP (3 tablet box) .. .. .. (In Irish Free State, soap prices are one-third more.)	1/6	13/6 per doz.
GLAXO FEEDERS, Complete, 8 oz.	1/6	13/6 per doz.
GLAXO FEEDERS, Spare, 8 oz.	1/–	9/– per doz.
GLAXO FEEDERS, Premature, 4 oz.	1/6	13/6 per doz.
GLAXO FEEDERS, Miniature, 2 oz.	1/6	13/6 per doz.
GLAXO FEEDER MOPS ..	0/4	3/– per doz.
GLAXO MATERNITY BELTS (9 in. or 10 in.) .. (Belts are not sent on approval.)	7/6	6/– each.
GLAXO MEASURES (Aluminium)	0/6	4/6 per doz.
GLAXO NURSLING TEATS	0/9	6/9 per doz.
GLAXO TEATS (7 kinds—square or fine hole, premature, blind, and 1, 3, or 5 leech-bite)	4½d.	3/4½ per doz.
GLAXO VALVES	3½d.	2/7½ per doz.

Address Inquiries to SALES MANAGER, 56 Osnaburgh Street, LONDON, N.W.1

SAVE TIME AND MONEY

You save both time and money and get more satisfactory results when capping your bottles with VITREO-COLLOID BOTTLE CAPPING SOLUTION. The many advantages that this wonderful preparation has over old-fashioned methods is bound, before long, to bring it into universal use. V-C is supplied in an

UNLIMITED RANGE OF COLOURS

and is eminently suitable for capping all bottles

It is extremely simple to handle. It is grease-proof and hermetically seals indefinitely. It is non-inflammable in its dry state. It is hygienic, safe, repels dirt, and preserves a bright, clean, attractive appearance. Will not crack, chip off or deteriorate, and is very much cheaper to use.

YOUR CAPPING PROBLEM IS SOLVED WHEN YOU USE

VITREO-COLLOID

BOTTLE CAPPING SOLUTION

Take advantage of this up-to-date time and money saving, all British preparation, which is ALSO SUPPLIED IN

BEAUTIFUL, PERMANENT, ECONOMICAL METALLIC COLOURS

Gold, Silver, Blue, Green, Red, Orange, Violet—to enhance the beauty of PERFUMERY bottles. These colours are Permanent and a perfect Gold finish can be obtained, which is quite as attractive and lasting as expensive gold leaf—and much cheaper.

V-C is sold in 1 lb. tins or in 1 gallon cans.

MAY WE SEND SAMPLES OR CHARTS SHOWING RANGE OF COLOURS?

Obtainable from all WHOLESALERS or from our Sole Selling Agents:

S. MURRAY & CO., LTD.

Record House, 11/13 Farringdon Road, LONDON, E.C.1

'Phone Holborn 0717 & 0718. 'Grams: "Depressors, Smith, London."

JOHN M. NEWTON VITREO-COLLOID, LTD.
Kingsbury House, King Street, London, S.W.1

V-C MEANS ECONOMY AND MORE ATTRACTIVE GOODS

V.F.

In the last 5 years the sales of

TOWN TALK

LIQUID SILVER POLISH & SILVER PLATE CLOTH

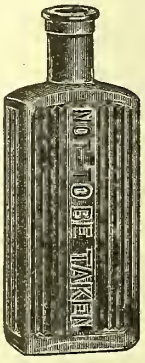
have increased 3 Fold

Get *your* share of the trade by ordering from

JAMES WOOLLEY, SONS & CO., Ltd., Manchester
AYRTON, SAUNDERS & Co., Ltd., Liverpool
BROOKS & WARBURTON (American Drug Supply Co.), Ltd.

Town Talk Polish Co.

Whitby St., Bradford Road, Manchester



Machine Made POISON BOTTLES

Have the following advantages over Hand-made Bottles:

ACCURATE CAPACITY
UNIFORM SHAPE
UNIFORM SIZE OF NECK
UNIFORM COLOUR

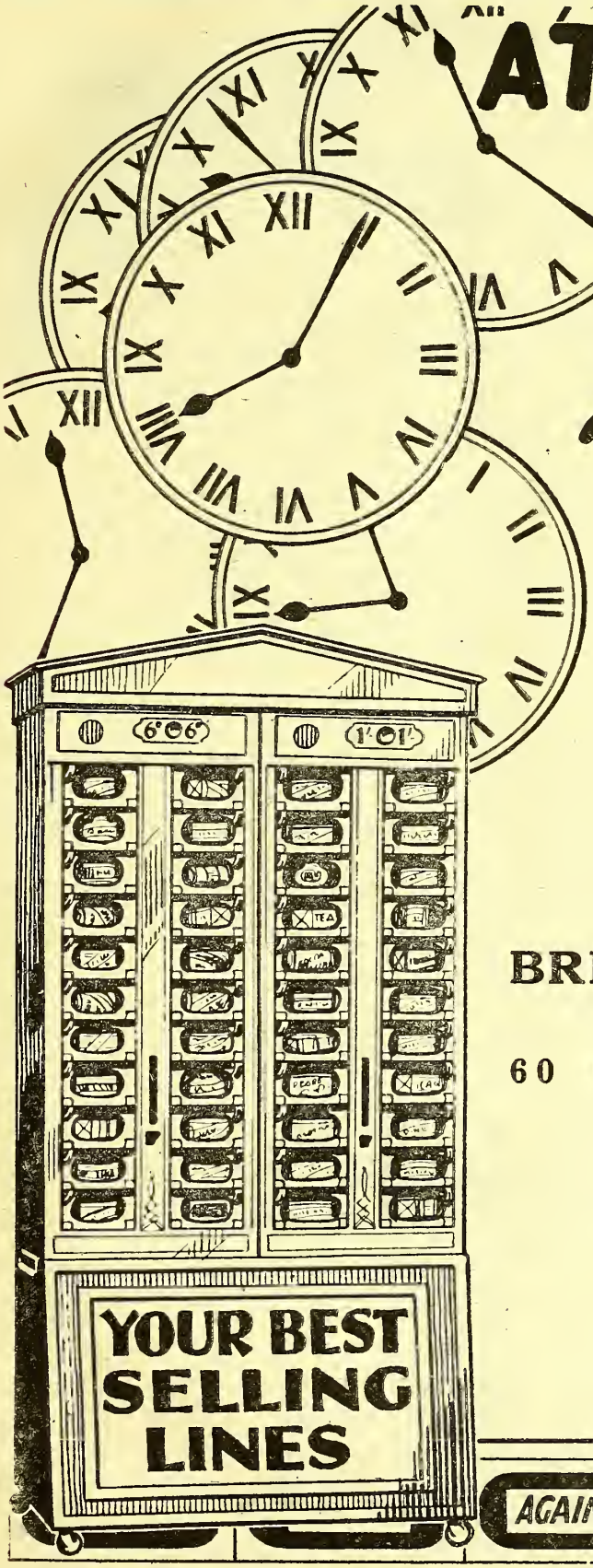
Stocks kept of the following sizes in Flat and Hexagon, Blue and Green.

Original	½	1	2	3	4	6 & 8	oz.
Crates	25	15	10	6	5	4	4 Gross.

Only Wholesale Houses Supplied.

WEISS, BIHELLER & BROOKS, Ltd.

70/71 Chiswell Street, London, E.C.



AT ALL HOURS This Salesman works for You!

HERE is a Salesman who is inexpensive, who always checks sales, who is never caught napping with bad coins, and who works the whole 24 hours day after day, year after year, without complaint.

British Automatic Vending Machines are BRITISH.

The improved fool-proof, reliable designs of the present day are the result of 28 years' solid experience in their manufacture.

B.A.V. Machines will protect your takings and increase your profits.

Let us quote you for the type of machine best suited for your purpose. Send a P.C. or, better still, call at our Showrooms and test our machines for yourself.

We are Sole Proprietors of the latest British Wistoft Patents —a combination of the finest all-protective mechanisms.

BRITISH AUTOMATIC VENDORS, LTD.

60 HOLBORN VIADUCT
LONDON, E.C.1.

PROTECTIVE B.A.V. MECHANISMS

Phone: Central 8610.

AGAINST ALL OTHERS

THE CHEMIST AND DRUGGIST SUPPLEMENT

42 CANNON ST.
LONDON E.C.4

JULY 6, 1929

This Supplement is inserted in every copy of The Chemist & Druggist

THE CHEMIST AND DRUGGIST SUPPLEMENT

REVISED ADVERTISEMENT TARIFF.

Businesses Wanted and for Disposal, Premises to Let, Goods for Sale and Agencies—6/- for **50** words; every additional **10** words or less, **6d.**

SITUATIONS OPEN—6/- for **40** words; every additional **10** words or less, **6d.**

SITUATIONS WANTED—2/- for **18** words; every additional **10** words or less, **6d.**

Legal Notices, Tenders, Auctions, and all specially-spaced announcements, **1/3** per nonpareil line (12 lines = 1 inch single column).

Miscellaneous (Wholesalers') Section for odd and second-hand lots—**10/-** for **60** words; **1/-** for every additional **10** words or less.

EXCHANGE COLUMN (for Retailers, etc.)—**Twopence** per word, minimum **2/-.**

BOX NUMBER.

In each case replies may be addressed to a registered number or nom-de-plume, c/o this Office, **at a charge of 1/- extra** for each advertisement.

PAYMENT.

All Advertisements are prepaid, so that remittance must accompany instructions in each case. If it be necessary to telephone or telegraph an urgent announcement this may be done, provided the money is telegraphed at the same time.

THE CHEMIST AND DRUGGIST, 42 Cannon Street, LONDON, E.C.4.

Telephone: Central 3617 (3 lines). Telegrams: "Chemicus, Cannon, London" (2 words).

CLOSING FOR PRESS.

ALL ADVERTISEMENTS INTENDED FOR INSERTION IN THIS SUPPLEMENT MUST REACH US NOT LATER THAN **FIRST POST THURSDAY MORNING.**

CHEMISTS' TRANSFERS.

Messrs. Orridge & Co., 56 Ludgate Hill, E.C.

Telephone No.: CITY 2283.

May be consulted at their Offices on matters of Sale, Purchase and Valuation

1.—LONDON, W.C.—General Retail and Dispensing Business; returns about £2,500 per annum, with scope for increase; stock and fixtures estimated to be worth £1,000; rent £120 per annum; held on lease; price to be arranged.

2.—LONDON, S.E. (Distant Suburb).—General Retail and Dispensing Business, with N.H.I.; established many years; returns between £1,500 and £1,600 per annum, with scope for large increase under modern management; living accommodation; rent £45; long lease; price to be arranged.

3.—ESSEX.—General Retail and Dispensing Business, with Photographic; returns last year approached £2,250, with scope for increase; house sub-let to cover the whole of rental; well-fitted shop, amply stocked; price about £1,450.

4.—EAST LONDON.—Working-class Business, with N.H.I. Dispensing and Post Office; excellent opening for Photographic; returns last year £2,310; net profit £500, plus £150 from Post Office; single-fronted shop; good saleable stock; six-roomed house; new lease will be granted; price £1,650.

5.—CITY PHARMACY.—Cash Retail and Prescribing Business; average net profit exceeds £850; scope for increase; shop fitted in mahogany and fully stocked; rent £246 per annum inclusive; held on lease; price asked £3,250.

6.—WEST-END.—High-class Retail and Dispensing Business, with Kodak Agency; established many years; turnover for current year will be about £5,250; gross profit 38½ per cent.; single-fronted, lock-up shop, with cellarage; 21 years' lease; rent £300; price £3,250 net.

7.—LONDON, W.—Middle-class Business, with side lines; established 50 years and in present hands 10; net profit £360, plus N.H.I.; lock-up shop; rent £104 inclusive; long lease; price asked £1,000.

8.—HERTS (Market Town).—Good-class Retail and Dispensing Business, situate within half an hour of town; established 80 years; returns last year £2,000, increasing; gross profit £700; nice house with garden; rent £50; new lease will be granted; stock and fixtures estimated at £1,100; offers invited. Vendor is desirous of selling quickly, having purchased another business.

9.—MIDLANDS (Death Vacancy).—High-class Dispensing Business, with Kodak and Rexall Agencies; returns £2,800; net profit £670; double-fronted shop, handsomely fitted; estimated value of stock and fixtures £1,800; convenient house; new lease will be granted; valuation terms entertained.

10.—SOUTHERN COUNTY.—Retail, Prescribing and Photographic Business; returns last year £2,027 at usual prices; double-fronted main road shop; lease 18 years unexpired; net rent £90 per annum; good house; price £1,400.

11.—SALOP.—Good-class Retail Business, with Kodak Agency; very old-established; returns £3,600; net profit roughly £700; large shop in principal street; estimated value of stock and fittings £1,400; price of business £2,000; property must also be purchased.

12.—HEREFORDSHIRE.—Drug Store with Kodak Agency; returns exceed £1,350 per annum at good prices; double-fronted shop, well fitted and stocked; rent £75; held on lease; price £750; there is a house which can be had if desired.

13.—ESSEX.—Old-established General Retail Business, with Kodak Agency; returns average nearly £6,000 per annum at good prices; estimated value of stock and fixtures £2,750; the whole of the premises are used for business purposes; a new lease for 21 years will be granted at £350 per annum; terms, goodwill £2,750, stock and fixtures at valuation; property may also be purchased if required.

14.—MIDDLESEX.—Branch Business for Disposal; returns between £20 and £25 weekly, under management; lock-up pharmacy (main road); lease 20 years to run; rent £1 weekly; vendor will accept £250 to effect an immediate sale.

Messrs. O. & Co. desire to emphasize the necessity of a periodical Statement of Account by which means alone **Profit, the Value of Business, &c.,** can be determined. Involving as this does the labour of Stocktaking and Valuation, it is often omitted and eventually becomes confusion and loss.

Valuations for Stocktaking

Messrs. O. & Co. are prepared to undertake these essential duties and make **Special Terms** for such service.

ORRIDGE & CO., 56 LUDGATE HILL, LONDON, E.C.4

The Association of Manfg. Chemists, Ltd.

Business Agency, Transfer & Valuation Department

Head Offices—**Kimberley House, Holborn Viaduct, London, E.C.1 (and at 2 Bixteth Street, Liverpool).**

PARKIN S. BOOTH, *Valuer.* *'Phone: City* 1261-2-3

BUSINESSES FOR DISPOSAL

1.—CARMARTHENSHIRE.—Old-established Chemist's Business situated in good position on main street, with living accommodation; held on lease for 7-14 years; rent £400 p.a.; returns average £35-40; could be increased; stock approx. £8-900. Further particulars on application. (176)

2.—DEVON.—Very old-established Business on lease 6 years at small rental; at present returning £20 per week; could be considerably increased with energy and capital. Double-fronted shop, well fitted. No N.H.I. done, but scope for same; no opposition. (1)

3.—SOUTH WALES DISTRICT.—Old-established Business, situate in main street; rental £52 p.a.; lease for 7 years will be granted. Offers invited.

4.—SCOTLAND.—Old-established Cash Business in City main road, on lease at low rental; returns £1,700 p.a. Double-fronted shop, beautifully fitted throughout in mahogany; splendid scope for optics. Recommended. (198)

5.—LONDON, E.—Old-established Retail and Dispensing Bnsiness; returns £3,600 p.a.; good living accommodation; freehold for sale, or would consider granting a lease; strongly recommended. Further particulars on application. (188)

6.—LONDON, N.—Established Chemist's Business; premises, which include convenient living accommodation, held on lease, 15 years to run; rental £50 p.a.; stock approx. £285; price asked £550, all at. Further particulars on application. (180)

7.—LONDON, N.W.—Retail Dispensing Business on 13 years' lease at £52 per annum inclusive; returns £1,000 p.a.; excellent opportunity for young qualified man. Further particulars on application. (183)

8.—LANCASHIRE (Seaside Resort).—Death vacancy. Old-established Dispensing and Retail Business; lock-up shop under first-class hotel; on lease; returns over last four years average £1,900 p.a.; could be considerably increased under personal supervision; specially recommended. Further particulars on application. (192)

9.—CITY Business for disposal, turnover of over £4,000 p.a., showing good net profit; well fitted in mahogany and well stocked; on lease at an inclusive rental, part sublet. Further particulars on application. (2)

10.—SOMERSET.—Drug and Photographic Business; premises, which consist of lock-up shop with room at rear, held on lease with 8 years to run at a rental of £88 p.a. inclusive; good scope for live man; price asked £400. (178)

11.—LONDON, E.—Small Branch Business for quick disposal on lease 7 years at £38 p.a.; returns £15 weekly; living accommodation; good reasons for disposal; suit young, energetic pharmacist. (199)

12.—HAMPSHIRE.—Family Dispensing and Retail Business for immediate disposal; premises held on lease 14-21 years at a rental of £90 per annum, including excellent living accommodation, garage, good garden; old-established business; shop beautifully fitted; returns £1,900; Medical Wine Licence; price to be arranged; full particulars on application. (190)

13.—GLAMORGAN (Seaside Resort).—Handsome lock-up shop; unopposed position in rapidly developing district; large window, on main thoroughfare; on lease at low rental; returns average £1,000 p.a.; splendid opportunity. Applications for further particulars invited. (194)

14.—YORKS.—Dispensing and Retail Business, on lease 7 years at £52 p.a.; rates £32 p.a.; average returns £18 per week; modern house, 8 rooms; splendid opportunity for young energetic man. Fullest particulars on application. (193)

15.—LONDON, N.W.—On lease, 8 years to run, at rental of £78 p.a. inclusive; returns £10 per week; excellent opportunity for qualified man; good opening for N.H.I. Further particulars on application. (195)

16.—LONDON, S.E.—Recently-established Chemist's Business for immediate disposal; lease 18 years to run at small progressive rent; lock-up, double-fronted shop, well fitted in mahogany; returns approximately £900, which can be considerably increased with personal supervision; further particulars on application. (197)

Stocktaking and Valuation of Businesses undertaken at moderate inclusive fee. Chemists are invited to consult us in respect of their requirements in connection with sale or purchase of businesses. Chemists in the North are requested to communicate with our Liverpool Offices.

BERDOE & FISH CHEMISTS' VALUERS & TRANSFER AGENTS

41 Argyle Square, KING'S CROSS, W.C.1

(One minute from St. Pancras and King's Cross Stations.)

1.—WYE VALLEY (Near).—Old-established, high-class Business in very best position of market town; returns over £3,000; good profits; audited books; modern pharmacy and large house; long, valuable lease; price about £2,200.

2.—HERTS.—Good-class Country Retail, in market town, easy reach of London; returns £2,000; gross profits £700; nice house and garden; low rent; on lease; stock and fixtures worth £1,100; offers invited.

3.—SURREY (Banks of Thames).—Good-class Business, in very best position, growing district; returns £1,900; modern pharmacy with flat over; good stock; price £1,500.

4.—EAST MIDLANDS.—Light Cash Retail, Dispensing and Photographic Business, in busy town; returns £1,200; plenty of scope; same hands 40 years, and retiring; price £800.

5.—SOUTH WALES (Popnlar Seaside Resort).—High-class Cash Retail, in main shopping centre; retnrns £3,100; good house; large pharmacy; heavily stocked; price £1,650.

6.—SOUTH COAST.—Good-class Retail and Photographic Business, with exceptional sale of own specialities; returns, under manager, £1,450; plenty of scope; central position; handsomely fitted pharmacy and good stock; price £1,050.

7.—LONDON, N.W.—Sound Light Cash Retail, with Kodak and Rexall Agencies; returns average £2,500; good profits; long lease; lock-up shop; well stocked; price for early sale £1,350.

8.—LONDON SUBURB, S.W.—Good middle-class, with Kodak Agency, returning nearly £1,700; main road position; scope for increase; handsome modern pharmacy; good stock; price £1,000.

9.—LONDON, W.—Good-class Cash Retail, with Kodak Agency; returns about £2,200; net profit £550; audited figures; lock-up pharmacy; good position and fully stocked; price £1,350.

10.—CRYSTAL PALACE DISTRICT.—Old-established light suburban Retail, in good position; returns £1,265; net profit nearly £400; audited books; good house; well stocked; price £850.

BUSINESSES WANTED.

BERDOE & FISH are in immediate want of sound Businesses up to £4,000, and cordially invite correspondence from intending vendors. We have a large number of cash buyers waiting, and are able to negotiate sales quickly and without publicity. Transfer Offices, 41 Argyle Square, King's Cross, W.C.1. Estab. 1870. Telephone: Terminus 3574.

JOHN BRIERLEY, F.N.A.A.

CHEMISTS' VALUER and TRANSFER AGENT,
135 QUEEN ST., NEWTON HEATH, MANCHESTER

Satisfied Pharmacists appreciate my methods of doing business. Expert service, straightforward deals and strict privacy guaranteed.

Valuations by fully qualified staff. (Tel. Failsworth 113)

TWO BUSINESSES FOR SALE.

One, South Wales, returns £1,000, good general retail with good prospects. Lock-up shop. Price £300. House could probably be had. Other returns about £750, Staffs., good house. Price £300.

BRETT & CO., 20 Springfield Road, Leicester

If you require the services of a VALUER for the SALE or PURCHASE of a CHEMISTS' BUSINESS, write to me.

CHARLES E. NAYLOR

CHEMISTS' VALUER,
170 Vesper Road, Kirkstall, LEEDS.
Tel.: Horsforth 324.

PARTNERSHIPS.

PARTNERSHIP in old-established Business of Herbalist for disposal in East Anglia (50 years' standing); the business carries with it a (Registered) article with ever-increasing sales; a splendid opportunity for a fully qualified Dispenser; the business is situate in the centre of the city; fullest particulars, either personally or through the firm's accountants; only a moderate sum will secure this. 152/388, Office of this Paper.

REQUIRED by Chemist's widow, Partner with capital to invest; qualified widowor preferred (middle-aged). Apply 152/389, Office of this Paper.

BUSINESSES FOR DISPOSAL.

BIRMINGHAM.—A very genuine, old-established Business for Sale doing £28 weekly (which includes about 1,000 N.H.I. per month), making a gross profit of 38%; accountant's figures; rent £40 per annum and rates £20; good, clean, new stock and well fitted; good reason for selling; bargain at £750. Apply 18/16, Office of this Paper.

BIRMINGHAM (Suburb).—A genuine old-established good-class Business for Sale, in healthy pleasant district; returns £1,800, with side line making extra profit of £10 monthly; good house with garage attached at low rent on lease; heavily stocked and newly fitted; good profits; easily managed; bargain. Apply 21/27, Office of this Paper.

DEVON.—Owner retiring; Dispensing and Family Business (same proprietor for 25 years); excellent position; fine corner premises; good living quarters; side entrance; would sell freehold premises or let to suitable person; gas, electric, 'phone; growing district. Apply 14/34, Office of this Paper.

DORSET.—Chemist's Business, prominent position in growing residential district, about 7 miles from Bournemouth; well-fitted modern shop, with excellent living accommodation, on lease; price only £700, all at; books available; genuine. Apply 20/7, Office of this Paper.

HERTFORDSHIRE.—A very sound old-established Country Business, 20 miles from London (train half an hour); receipts £2,000; gross profit £700; rent £50; nice house and large garden; banker's reference, please. 152/380, Office of this Paper.

HEREFORDSHIRE.—For Sale, old-established Chemist's Business, situated in good agricultural town; best position; main street; lock-up shop, or with house, optional; turnover approaching £1,400, with plenty of scope for increase; price £750. Full particulars on application. 20/10, Office of this Paper.

LIVERPOOL.—Up-to-date Pharmacy, in excellent locality; ideal fittings; sound stock; lock-up; net profit £450; genuine reason for disposal; books audited. Apply in the first instance, with bank reference, to "R. D.," c/o R. Spencer Terry, Chartered Accountant, 41 North John Street, Liverpool.

LONDON, S.E.—Sound Business, panel alone pays qualified manager, centre of thickly populated area; house attached if required; vendor's property; lease to suit purchaser at reasonable rent; ill-health the only reason for disposal; cash required about £650. For interview, etc., apply P.C.B. 43/26, Office of this Paper.

LONDON, W.—£150, plus stock and fixtures at valuation, secures good-class Dispensing and Family business; returns £20 per week, and capable of considerable increase. Apply 22/28, Office of this Paper.

MANCHESTER SUBURB.—Established Business in good-class district; prominent position; turnover £1,500, increasing each year; N.H.I. average 300 scripts per month; Kodak Agency; good D. & P. connection; opening for Optics; well stocked; excellent fittings; good living accommodation; references required. Apply 13/35, Office of this Paper.

NORTH WALES.—Country Business for disposal; has been carried on very successfully for many years by the widow of the late proprietor, who now wishes to retire; excellent opportunity for a qualified man to develop N.H.I.; can be bought at a very reasonable figure. Apply "North Wales," c/o Evans Sons Lescher & Webb, Ltd.

NEWCASTLE.—In good residential district, old-established Family Business for Sale; N.H.I., Prescribing, Photo, Stationery and Newsagency as side lines; returns £1,500, with scope for increase; low price; convenient house, four rooms and bathroom, electric, side entrance; rent £52; rates about £21; owner retiring. "Chemist," 24 Sceptre Street, Newcastle-on-Tyne.

NORTH YORKSHIRE.—Drug Store; main street; nicely fixtured; good stock; bargain for quick sale; price £250; good reason for disposal. 20/2, Office of this Paper.

SHEFFIELD.—Old-established (50 years) Drug Store, with Photographic and Cigarettes, also small Wholesale trade; suit qualified lady; good opening for N.H.I.; six-roomed house; private back; vacant possession could be arranged. For price and particulars apply 21/11, Office of this Paper.

SOUTH COAST.—Old-established Business by private treaty; prominent corner; main road; middle-class Family trade; large N.H.I. Dispensing, Photographic; returns average £2,000; ill health reason; £3,000; part can remain. 152/376, Office of this Paper.

SOUTHEND-ON-SEA.—Drug Store; established 11 years; takings £600; rent £26; lease 5 years; goodwill very cheap; urgent reason for selling; stock at valuation; guaranteed genuine business. Leates, First Avenue, York Road, Southend-on-Sea.

SOUTH-WEST WALES.—Unopposed Mixed Country Business, with Optics; seaside resort; freehold house in thorough repair; Kodak; good reason for selling. Fuller particulars to George Brown, c/o Evans Lescher & Webb, Ltd.

SUFFOLK (seaside resort).—Old-established Retail, Prescribing Business; proprietor retiring; returns £1,400; low expenses; excellent opportunity for live man. Full particulars, 16/34, Office of this Paper.

SURREY.—Good-class Business on main road; bus and tram terminus; corner shop; living accommodation if required; at present let off; well stocked and fitted; expenses low; turnover £30-£40; long lease; pleasant locality, Thames Valley; offers. 13/32, Office of this Paper.

SUSSEX COAST.—A small Light Retail and Photographic Business, on main road to sea front; excellent opening for Optics and ample scope for N.I.D., not at present undertaken; modern double-front and well-fitted shop; back entrance and room for garage; personal interview desired for details. 21/20, Office of this Paper.

BUSINESS and Premises for Sale on Essex Coast; must sacrifice through ill health; handsomely fitted shop in growing neighbourhood; Kodak Agency; returns £1,350, at good profits; price £900; 6-roomed house, freehold property, at valuation; mortgage can be arranged. 14/11, Office of this Paper.

CHEMIST'S Branch, now Drug Stores, situated main road Lancashire town; good opening for Photography, Optics and N.H.I.; handsomely fitted and compact; electric light throughout; suit energetic qualified man; good opportunity; genuine offer; price £150 cash. Address, by letter, "Chemist," 49 Belmont Road, Ashton-on-Mersey, Manchester.

DRUG STORE.—Village, Lincs; good house and garden at 12s. rent; well stocked; established over 5 years; sound reasons for selling; good opening; reasonable price asked. 20/40, Office of this Paper.

FOR Sale, West Wales Chemist's Business; seaside and agricultural area; attractive shop front; excellent fittings; good reasons disposal; purchase freehold optional. 11/27, Office of this Paper.

FOR Sale as a going concern, complete Chemist's Stock, Shop-fittings and Fixtures, Photographic equipment, together with assignment of rental lease for a further two years; business situate at Newquay, Cornwall; sale must be immediate. Apply, Tripp, 21 King Street, Truro, Cornwall.

GOOD opportunity for capable qualified man with small capital; Business in Lancashire for disposal; lock-up shop; rent rates and fixtures 25s. per week; stock at valuation; goodwill free. Further particulars, Ayrton, Saunders & Co., Ltd., Liverpool.

LIGHT Retail Business for Sale, pleasant district, South Wales; main road; good living accommodation; turnover £1,800; good profits; shop nicely fitted and prominent windows; price about £400. 14/14, Office of this Paper.

OLD-ESTABLISHED (30 years) Chemist's Business at Pendlebury, Manchester, for Sale, with N.H.I. Dispensing; good opportunity for energetic man; Retail business; good living accommodation; Premises also for Sale. Apply Brooks, Marshall, Moon and Co., Solicitors, 55 Brown Street, Manchester.

OLD-ESTABLISHED mixed country Business; no opposition; Kodak, Nyal and Rexall Agent; good profits; good house and large garden, etc.; accountant's figures; net profit last year £531 10s.; banker's reference required; business and freehold property to be sold together £2,500. 22/11, Office of this Paper.

PROSPEROUS and well-established Chemist's Business in Midland Spa; main road; splendid position; high-class Dispensing connection; N.H.I., Kodak and Rexall Agencies; beautifully fitted double-fronted shop; modern dwelling-house; latest improvements; present hands 20 years. 14/1, Office of this Paper.

£180 ALL AT.—Drug and Photographic Stores, W.; established 12 months; fairly stocked and fitted; large shop, back room and dry basement; in densely populated district; big scope for N.H.I.; grand chance for M.P.S. Write only, "C.," 59 Dalling Road, Hammersmith, W.6.

£325, S.A.V., for quick sale, Chemist Business in South-West London; thickly populated district; double-fronted lock-up shop; main road position; returns £18 to £20 per week; held on lease; moderate rent. 14/27, Office of this Paper.

£350 SECURES established Business, well fitted and stocked; also 9 years' lease of good corner position on main road in largely populated district; nice house with private entrance; gas, electricity, bath, etc.; this business in the right hands should prove a good investment; excellent opening for Optics, etc. Bright Bros., Market Chambers, Mansfield.

BUSINESSES WANTED.

CHEMIST-OPTICIAN requires genuine Business on South or South-East Coast or near; main road position and busy locality essential; living accommodation; neglected business not objected to; returns not less than £1,500; references can be given if required. "Neale," 18/8, Office of this Paper.

GOOD-CLASS Family Business, with Photographic connection, or scope for increase in this direction; turnover about £2,000; country district preferred. Full particulars to 22/1, Office of this Paper.

MEDIUM-SIZED Chemist's Business; suitable for lady; Midland Counties preferred; fullest particulars required. Apply to Taylor, Ashbourne House, Chester Road, Kidderminster.

PRIVATE Chemist desires to purchase Business; London or South preferred, but not essential; cash purchase; small or neglected business with prospects considered. Please give full particulars first letter, strictest confidence. P.C.B. 43/22, Office of this Paper.

£400 WAITING for middle-class Chemist's Business; Yorkshire city preferred. 20/4, Office of this Paper.

PREMISES TO LET.

CITY OF PETERBOROUGH.—To Let, an attractive freehold double-fronted shop, in excellent position, and within one minute of four Doctors' surgeries; rent £150 per annum; excellent opportunity for chemist. For order to view and further particulars, apply to Arthur E. Craig & Co., Ltd., Westgate, Peterborough.

LEEDS (suburb of).—Good Shop with House to Let or for Sale with immediate possession; this is a sound proposition for Chemist, as there is none in the district and one is urgently required; doctors near; opposite large co-operative stores. Apply Livingstone, 99 Camp Road, Leeds.

SUFFOLK.—To Let, large Lock-up Shop, Market Place, Botesdale; excellent position; good opening for Chemist (nearest 6 miles); vacant; rent £13. Particulars, Wells, 4 Richmond Park Road, Bournemouth.

SHOPS with Flat over to Let on lease in excellent position at Bromley; suit Chemist. Apply Baxter, Payne & Lepper, opposite G.P.O., Bromley, Kent.

PREMISES FOR SALE.

LARGE semi-detached Freehold House, next door to shops, suitable for Chemist's; large estate; no chemist for two miles; contains three bedrooms, two reception rooms, bathroom, kitchen, and scullery, two w.c. Apply Owner, 19 New Road, Mitcham Junction, Surrey. Price £875.

LEASE FOR SALE.

PREMIUM required for Lease of Shop and living accommodation, opposite picture house, main street, busy town, Surrey; suitable for Chemist. Particulars write 12/38, Office of this Paper.

APPOINTMENT.

BIRMINGHAM CENTRAL TECHNICAL COLLEGE.

APPLICATIONS are invited for the post of Lecturer and Demonstrator in Pharmacy. The position is a whole-time appointment, commencing on 1st September next. Candidates must possess the Major qualification of the Pharmaceutical Society. Preference will be given to applicants who also possess a Science Degree and some teaching experience. Salary in accordance with the Burnham Scale. Particulars of the appointment will be sent on receipt of a stamped addressed foolscap envelope by the Principal of the Central Technical College, Suffolk Street, Birmingham, to whom applications, on the special form provided, should be returned by July 13th.

P. D. INNES, Chief Education Officer.

AGENCIES.

CONTINENTAL Manufacturer of Powder Puffs and Powder Sifters is anxious to secure representation in this country with a firm having an established connection. Replies to be addressed in the first instance to 20/29, Office of this Paper.

SITUATIONS OPEN.

RETAIL [HOME].

BIRMINGHAM.—Capable, qualified Assistant (lady preferred); good Dispenser, Salesman, and thorough knowledge of Photographic Goods, etc. Apply, stating age, height, salary and full particulars in first instance, to 13/14, Office of this Paper.

BIRMINGHAM.—Improver or Junior; good appearance and address. State experience, age, height, salary. Applications not answered in 7 days respectfully declined. Photographs if sent with stamped addressed envelopes will be returned. 21/25, Office of this Paper.

BLACKPOOL.—Junior Assistant (male) required mid-July for season; outdoors; must be a quick Counterman, active and obliging; one with a knowledge of Photography preferred, but not essential. Please state usual particulars and enclose photo if convenient to Harold Jackson, M.P.S., The Imperial Pharmacy, North Promenade.

BOURNEMOUTH (near).—Qualified Assistant wanted (either sex) to open new business in growing working-class district; new premises; living accommodation if required; must be thoroughly reliable. Give full particulars, age, and salary required to H. F. Payne, Branksea Avenue, Hamworthy, Poole.

BRIGHTON.—Junior Assistant (male), accustomed to good-class Dispensing business. Please give full particulars in first letter. Parris & Greening, Church Road, Hove.

BUCKS.—First-class Manager required for a good Family business (with house attached); applicants must be married and have had experience in this type of trade; this is a splendid opportunity for a keen business man who is not afraid of work, and who is anxious to make headway. All details of age, experience, salary, etc., required. 21/127, Office of this Paper.

CAMBRIDGE.—Required, at once, a qualified lady Assistant. Apply S. F. Barker, 46 Chesterton Road, Cambridge.

DERBY.—Young Assistant wanted for good-class country business; no N.H.I. dispensing. Please send full particulars of experience, references, and salary required to H. Monkhouse, Chemist, Derby.

EDMONTON.—Qualified live man required to take charge immediately; living accommodation available if necessary. Apply Bernstein, 128 Balls Pond Road, N.1.

HALESWORTH (SUFFOLK).—Junior wanted shortly for about two weeks only (indoors), whilst permanent assistant is on holidays; country market town business with short hours; close to sea. Write, stating when can come and indoor salary, Mr. Keeble (Gostling's), Halesworth, Suffolk.

ILFORD.—Qualified Manager, male, age between 30 and 40 years, wanted on or before July 22 for good-class Branch Pharmacy (outdoors); must be a smart Counterman and good Window-dresser. Apply, stating age, experience, references, salary required, and photo if possible, to T. Bellamy, Pharmaceutical Chemist, Tindal Square, Chelmsford.

LIVERPOOL.—Qualified required for early August; brisk main road working-class business; Kodak Agency. Please state age, height, salary required, photo if possible, and references. Banner's, Ltd., 266 Smithdown Lane, Liverpool.

LIVERPOOL.—Two qualified Assistants; one to manage branch; middle-aged preferred; N.H.I., Window-dressing, also Prescribing; temperate. "Ferrum." c/o Ayrton, Saunders & Co., Ltd., Manufacturing Chemists, 34 Hanover Street, Liverpool.

LIVERPOOL DISTRICT.—Experienced Assistant required for middle- and working-class business; must be capable Window-dresser, reliable Dispenser, and efficient Salesman, with knowledge of Photographics; undeniable references essential. Give full particulars of experience, age, height, and salary required to 21/10, Office of this Paper.

LLANDUDNO.—Lady Assistant required, July 22, with Dispensing, Counter and Photographic experience; must be pharmacy trained. State full particulars, with salary required (outdoors), and photograph, to Miss Horniblow, 4 Queen's Buildings, Llandudno.

LONDON (near).—Qualified Assistant required, about 25; N.H.I.; permanency. Please state when disengaged and salary required. Write 13/40, Office of this Paper.

LONDON, S.E.—Assistant wanted, chiefly for Dispensing, whole or part of day, for a fortnight, commencing July 14 and one week in August, for which dates can be arranged. Applicants please state full particulars of experience, etc., to 13/36, Office of this Paper.

LONDON, E.—Reliable qualified Assistant; N.H.I., Photographics (D. & P. sent out). Please state when disengaged and salary required. 13/30, Office of this Paper.

LONDON, S.W.—Well-trained, qualified Assistant, accustomed to high-class Dispensing business; gentlemen with such experience desirous of West-End training will find this an excellent opening. Letters, stating age and giving full particulars and references, to 13/18, Office of this Paper.

LONDON.—Required, qualified man for about 2½ months from middle of July onwards. Apply, giving full particulars, to 13/24, Office of this Paper.

LONDON, S.E.—Qualified man immediately for easily worked branch; middle class; N.H.I. and Photography. Please state age and salary (outdoors) to P.C.B. 43/27, Office of this Paper.

LONDON, W.—Qualified Manager required for Family business (no house), with a large amount of N.H.I.; applicants must have good references and be able to increase turnover. Give full particulars of age, salary required, previous experience, etc. 21/128, Office of this Paper.

LONDON, S.E.—Junior Assistant required for a middle-class business; applicants must have had good experience at the Counter and be accurate Dispensers. Please supply full particulars, stating age, salary required, etc., to 21/124, Office of this Paper.

LONDON, S.E.—Qualified Manager (married) required; the position is suitable for a keen young man anxious to prove his worth; the business is in an industrial area, where a quick cash and N.H.I. business is carried on. When applying please state salary required, age, particulars of experience, etc., to 21/12, Office of this Paper.

LONDON, W.C.—A really smart Assistant required for a good-class business in main thoroughfare; keen, polite Counterman essential. Please send references and state in letter salary required, age, etc. 21/120, Office of this Paper.

LONDON, W.1.—Wanted, qualified Assistant (male), recently qualified; applicants with good Dispensing experience would be considered. Please give full particulars of experience, etc., salary required, and when disengaged to 21/21, Office of this Paper.

LONDON.—Assistant, accustomed to Family Retail and Dispensing business; obliging at Counter. Full particulars as to salary (outdoors), reference and experience, Alban Atkin, 243 West End Lane, Hampstead, N.W. Reply Alban Atkin, M.P.S., at Hothamton Court Private Hotel, Bognor.

MANCHESTER DISTRICT.—Wanted, for August 1, qualified Assistant for working-class business; permanency. Please state age, experience, and salary to 13/27, Office of this Paper.

MANCHESTER. — Capable, qualified Assistant - Manager wanted, with good references; no Sunday duty. 22/24, Office of this Paper.

MIDLAND CITY.—Qualified Chemist for high-class Dispensing business; must have had good experience; preference given to man with Optical qualification (but not essential); permanency. Please give full particulars of experience, salary, etc., to 22/16, Office of this Paper.

NORFOLK.—Reliable Unqualified Assistant required; good Dispensing and Window-dressing experience, with knowledge of Photography. State age, height, experience and salary required to 21/26, Office of this Paper.

RHYL, NORTH WALES. — Wanted, unqualified Junior Assistant immediately. State experience and salary required. Davies, Chemist, Rhyl.

ST. BARTHOLOMEW'S HOSPITAL, ROCHESTER.—Experienced lady Dispenser (Hall) required as Locum, July 15 to August 3; salary at the rate of £150 per annum. Apply, with copies of testimonials. to the Secrctary.

ST. MARYLEBONE. — Qualified Dispenser required, August 12-31; hours 9.30 a.m.-5 p.m., Saturday 10 a.m.-1 p.m.; salary £5 5s. per week. Apply, with full particulars, to Edward A. Frith, Clerk to the Guardians, Administrative Offices, Northumberland Street, W.1.

STAFFORDSHIRE.—A vacancy occurs for a Qualified Manager (single) to take chargc of a good-class business situate in the main street of a busy town; applicants must have had good exlcrience of this kind of business. Give full particulars, age, salary required, and when at liberty, etc., in first letter. 21/121, Office of this Paper.

WESTCLIFF, ESSEX.—Unqualified man wanted for Drug Stores just opening; scope for good man. 'Phone, write or call, Newland, 104 Valkyrie Road, Westcliff, Essex. 'Phone: Southend 2834.

WESTON-SUPER-MARE. — Unqualified Assistant (male) required end of July; permanency for good Dispenser, Window-dresser and Counter Salesman; Photographic knowledge; highest references and good appearance essential; age 21-25. F. Blackmore, Ph.C.

WEST LANCS.—A Qualified Manager is required for a good middle-class Family and Dispensing business situate in best part of large town; the selected applicant must be of smart appearance and have good personality. Kindly give all details as to age, salary required and previous experience. 21/129, Office of this Paper.

WOLVERHAMPTON.—Qualified Manager required for a busy middle-class business situate in the suburbs; there is a Wine Licence attached, and applicants must have a good personality and be thoroughly reliable. Give full particulars of experience, age, salary, etc., to 21/122, Office of this Paper.

WINDSOR.—Russell & Co., Chemists, Windsor, require a capable Assistant, about 26, for good-class business; must be gentlemanly and of good address. Full particulars and photo in first letter to Mr. J. Hewitt.

A QUALIFIED Manager is required for a business in one of the main streets of Hull; applicants must have been used to a busy Counter trade and be good Window-dressers. All details of age, experience, salary, etc., required. 21/130. Office of this Paper.

A VACANCY occurs for a well-educated Lady Assistant near Birmingham; the position is progressive and offers good scope for an experienced Assistant, who is keen and energetic. Please give all dctails in first letter. 21/123. Office of this Paper.

ASSISTANT required (lady or gentleman); must have had good-class experience in Dispensing, Counter and Window-dressing. Apply, stating age, height, experience, and salary required, to R. A. Neville, Chemist, 74 Cowley Road, Oxford.

ASSISTANT (qualified) wanted for West-End house. Apply, stating age, experience and salary required, to 152/378, Office of this Paper.

ASSISTANT; July to September; must be accustomed to brisk good-class Retail and Dispensing, with Photographics. State full details of previous experience, age, height, salary required, when disengaged, and if convenient enclose photo to D. T. Evans, Ltd., Chemists and Opticians, Margate.

COMPETENT Pharmacist required immediately as Manager of branch business (lady or gentleman); living accommodation suitable for two persons. Stanley Taylor, Hightown, near Liverpool.

ELDERLY qualified wanted for N.H.I. Dispensing; easy hours and comfortable berth to suitable man; London, S.E., district. 22/22, Office of this Paper.

IMMEDIATELY.—Competent Assistant required for General Family, N.H.I. and Veterinary business; must be quick and accurate Dispenser. Please give in first letter age, height, photo, salary required, and references. Dyson, Chemist, Barnstaple.

JUNIOR Assistant or Improver required immediately. Reply, stating age, when disengaged, salary required, and if possible enclosing photograph, to Messrs. W. Bates & Co., Ltd., 50 Oxford Street, Southampton.

JUNIOR Assistant wanted for about a month, commencing end of July; one with Harrogate experience preferred, otherwise good class. Give full particulars, with references and salary required, to A. Atkinson, 2 Parliament Street, Harrogate.

JUNIOR Assistant required; Counter and Dispensing. Full particulars, including salary required, to Gaskell, 379 St. John Strect, E.C.1.

JUNIOR or Improver wanted for General, Dispensing, Photographic business; smart appearance; photo; willing worker and obliging. Apply, stating experience, salary and references. Letters unanswered in six days declined. Mussell, 101 St. Mary's Road, Garston, Liverpool.

LADY Assistant required for good-class Dispensing business, Surrey; must be well used high-class Counter work and Dispensing. Send full particulars, age, height, experience, references, salary required, when disengaged, and enclose photograph if possible. Neathercoat, 61 Welbeck Street, London, W.1.

LADY to help in shop and house; suit domesticated person with experience of Chemist's business; comfortable home in nice district of North London. Please state experience, age, and salary required. "A. G. T.," 20/11, Office of this Paper.

LADY CHEMISTS, LTD., Daws Lane, Mill Hill, N.W.7, have a vacancy for Young Lady Apprentice in September; applicant should have passed Matriculation or equivalent examination; time allowed for classes; no premium.

LADY Assistant required for a business in East London in industrial area; applicants need not be qualified, but must be good Dispensers and have had Counter experience. Kindly oblige by giving full particulars of experience, salary, age, etc. 21/125, Office of this Paper.

LOCUM (lady), all-round experience; chiefly Counter; holiday duty three weeks July or beginning August. 14/21, Office of this Paper.

LOCUM wanted for one week, commencing July 15. Terms to Bishop, Chemist, Thames Ditton.

LOCUM, qualified, must have knowledge of Homœopathic Dispensing and Tablet Making, wanted for two or three weeks, August or September. Please give references, salary required, and when at liberty. Radford, 69 Temple Row, Birmingham.

LOCUM Tenens required for 5 weeks from July 15 to August 19 inclusive; applicants (male) must be qualified Chemists. Applications, enclosing testimonials, and stating previous experience (Hospital or such institution preferred), to be sent to Major Raphael Jackson, Secretary, Queen Mary's Hospital, Stratford, E.15, not later than July 12, 1929.

LOCUM, qualified, wanted from July 15 to 28; Dispensing only; salary £4 10s. per week. Write, stating age and experience, to Staff Manager, Welwyn Stores, Ltd., Welwyn Garden City, Herts.

LOCUM, qualified, required for high-class Pharmacy near London for two weeks from August 10; man recently qualified might suit, but must have good-class experience. 22/34, Office of this Paper.

MESSRS. PRICHARD & CONSTANCE require a smart young qualified Assistant (male). Full particulars to W. Robinson, 23 Haymarket, London, S.W.1.

PART-TIME Junior wanted, July 15, four evenings per week, 5.30-8, Saturdays from 1.30, and every third Sunday 11-1 and 6-8. Apply, with particulars of age, experience, and salary required, to "C. B.," 20 New Street, Dorset Square, N.W.1.

QUALIFIED lady Locum required from August 26 to September 16. Capable D. & P. State terms to Rowcroft & Co., Ltd., Chemists, 66 Week Street, Maidstone.

QUALIFIED Assistant; young; good Counterman and Window-dresser; able to take control. State age, salary required, and when at liberty, or apply personally to Knights, 298 Cavendish Road, Balham.

QUALIFIED Assistant required; must be quick and accurate Dispenser; good-class business; capable of taking charge; permanency. All particulars in first letter, with photograph. Applications unanswered in 3 days respectfully declined. H. Reynolds, 39 Belsize Road, Worthing.

QUALIFIED Assistant, single, about 27, accustomed to good-class Dispensing and Photographic. Send full particulars of experience, photo, and state salary expected. Greenfield, 41 Hall Gate, Doncaster.

QUALIFIED Chemist for branch department; experienced; reliable and energetic. Francis & Son, Ltd., Brixton Road, S.W.9.

QUALIFIED Assistant wanted, with a view to a Branch Managership at an early date. Apply, stating age, experience and salary required, to the Secretary, Shadforth Prescription Service, Ltd., 63 Grove Road, Bow, E.3, London.

QUALIFIED Locum required for one week, commencing August 10. Write age, experience, and salary required to M. Berry, 76 Carnarvon Road, Stratford, E.15.

QUALIFIED lady Assistant wanted immediately, just through Minor preferred, for Light Retail and Dispensing business; pleasant duties; permanency. Please forward full particulars, salary required, and photo (if possible) to Milnes & Lister, Ltd., 39 Bradford Road, Brighouse, Yorkshire.

QUALIFIED Manager; married; J.C.Q.O. qualification; good-class district; three other assistants kept; good living accommodation; splendid opportunity for up-to-date man. Send full particulars, experience, and salary required. A. G. Wrench, M.P.S., "Wyndyridge," Upfield, Croydon.

QUALIFIED Assistant (male) required as Locum; August 6 to 24th inclusive. State terms and particulars to Ipswich Industrial Co-operative Society, Ltd., 38 Carr Street, Ipswich.

QUALIFIED Manager required immediately for Drug Department on South Coast; personal interview preferred, or write, with full particulars and salary required, to Manager, Drug Department, International Stores, 67 High Street, North Finchley, N.12.

QUALIFIED Lady Assistant (M.P.S.) wanted immediately. Please state salary (outdoors) and usual particulars to Harold Dixon, 78 High Street, Dorking.

QUALIFIED Lady Assistant (Minor qualification); used to good-class Dispensing and Counter. Apply, with full details of references and wage required, Meyrick & Davies, Ltd., Wilton Court Pharmacy, Bexhill-on-Sea.

QUALIFIED Assistant; single; outdoors. Give full particulars of experience, salary, age, etc. Hillman Attwell, Pharmacist, Cranleigh, Surrey.

QUALIFIED Lady Assistant required for Family and Dispensing business in North London; applicants must be smart at the Counter and be accurate Dispensers. Give full particulars of age, salary, previous experience, etc. 21/126, Office of this Paper.

QUALIFIED, to manage branch on South Coast; not under 30; single; experienced; progressive position; live out. Fullest particulars, references, salary required, photo if possible, to 152/385, Office of this Paper.

QUALIFIED Assistant (lady or gent.) to manage small branch Pharmacy. Apply, stating age, experience and salary required, photo if possible. Apply 22/33, Office of this Paper.

QUALIFIED Assistant wanted; permanently; experienced in all departments; capable taking charge. Write, stating experience, references, age, salary required, and when disengaged. 22/25, Office of this Paper.

REQUIRED, immediately, capable qualified Manager; good knowledge of Photography essential. Reply, giving full particulars of experience, age and salary required, to Wingfield, Chemist, 9 Ilderton Road, South Bermondsey, S.E.16.

REQUIRED an Assistant for holiday relief, middle of July to end of August; must be capable of being left in charge; qualified lady would do. Full particulars, C. J. Roe, Chemist, Epsom

REQUIRED, a really smart Salesman; must be tall and of good appearance, a good Dispenser, and accustomed to a first-class West-End Chemist's business. Apply, by letter, giving experience, age, and salary required, to the Managing Director, Messrs. Sunshine Remedies, Ltd., 8 West Halkin Street, London, S.W.1.

UNQUALIFIED Assistant wanted at once for the season. Kindly state age, wage and references, photo if possible. Barmby's Cash Drug Stores, 33 Newboro', Scarborough.

UNQUALIFIED Assistant, about 30, used to good-class Dispensing and Counter, for East Sussex seaside resort. Apply, with full details of references and wage required, to 21/32, Office of this Paper.

WANTED, a keen, energetic Assistant (unqualified) for East London branch; must be good Salesman; no Sunday duties. Apply, stating age and salary expected, to "Roberts," 14/4, Office of this Paper.

WANTED, lady Secretary-Dispenser, qualified, for Medical Practice in country town; typewriting essential. Apply, stating experience, wages, etc., to 12/36, Office of this Paper.

WANTED, at once, qualified Pharmacist (male) for Liverpool. Reply, stating full particulars, to "B.," c/o Messrs. R. Sumner & Co., Ltd., Wholesale Druggists, Liverpool.

WANTED, Qualified Assistant (Miner), either sex, for Locum Work for either August 24 to September 7, or September 1 to September 14. State terms, with references, to W. J. Mumford, 127 Beulah Road, Thornton Heath, Surrey.

WANTED immediately for London Suburb, young Locum, qualified or unqualified, for a fortnight, commence as soon as possible; good wages. Apply P.C.B. 43/35, Office of this Paper.

YOUNG Qualified Assistant, lady or gentleman, for good-class Dispensing and Retail business. Full particulars to Bone, Chislehurst.

YOUNG and energetic Manager (qualified) required for relief duties; the work will extend to the end of September, and a permanent managership will be given to an applicant who proves his worth; this is a rare opportunity for a man who wishes to gain wide and varied experience before settling down. All particulars in first letter, please. 21/131, Office of this Paper.

WHOLESALE.

ABLE Representative required for Scotland by old-established firm to sell Hot Water Bottles, Bathing Caps, Bathing Shoes, and various other Chemists' and Departmental Stores' Rubberware; excellent connections essential; commissions ranging from 10% to 20% and an expense allowance after trial period. 152/377, Office of this Paper.

ADVERTISER would like to meet Pharmacist, 27-30 years of age, whose ambition is to get into the Sales Management Department of a Wholesale House; no capital or manufacturing experience required, but applicant must have had good scholastic and Retail training, and must possess initiative and administrative abilities; commencing salary £300 per year. 152/379, Office of this Paper.

ASSISTANT to Works Manager for London Wholesale Druggist; qualified and with similar previous experience. Apply, with particulars of experience, salary required, etc., to "Alpha," 152/386, Office of this Paper.

EXPERT Salesman, having first-class connection with Chemists, Hospitals, Medical Stores, etc., able to dispose of output of surgical cotton goods, etc. Apply, stating area covered, terms expected, and submit copies testimonials to 22/2, Office of this Paper.

FOREWOMAN required by Manufacturing Chemists; must be used to controlling staff; good experience labelling, wrapping, etc.; one with knowledge of Toilet Articles preferred. Write, stating age, experience, and wage required, to "E. D.," 152/384, Office of this Paper.

FULL-TIME Representatives required for various parts of Great Britain, to handle well-known products, amongst Dentists, Chemists, Industrial Houses, Institutions, etc. Applicants should possess sales experience, pharmaceutical knowledge, tact, initiative and energy; permanent and progressive positions for the right men. Full particulars, with three references and photograph, to Medical Products, Limited, Pinners Hall, Austin Friars, E.C.2.

IRISH FREE STATE.—Resident Representative required. State confidentially fully age and experience. 152/387, Office of this Paper.

LADY Shorthand-Typist and Book-keeper required by Wholesale House; one with a few years' experience preferred. Write, stating full particulars, to 21/38, Office of this Paper.

LADY CLERK.—A London firm of Manufacturing Pharmacists, employing a staff of lady clerks, have a vacancy for a well educated, refined, and intelligent girl, experienced in propaganda work; must be a good Stenographer and Typist; permanent position with good prospects. Address "Statim," 152/383, Office of this Paper.

NATIONALLY advertised, ready selling side line for active Representative, South Coast. Reply particulars, Punkt Products Depôt, 41, Great Tower Street, E.C.3.

REPRESENTATIVE required for South England by Wholesale Surgical and Druggists' Sundries House. Apply, giving all particulars (in confidence), stating connection, age, and salary required, P.C.B. 43/24, Office of this Paper.

REPRESENTATIVES, with own car, wanted, with live connection amongst Chemists and Hairdressers in the following districts:—Districts Nos. 12-13, Yorkshire; District No. 3, Hants, Berkshire, Isle of Wight and Dorset; District No. 18, North Scotland; District No. 20, North Ireland. A wonderful opportunity with good income for the right man; applicants must be well introduced and have good sales record; two up-to-date references required; must reside in district allotted. Apply 15/33, Office of this Paper.

REQUIRED, at once, well-educated gentleman (or lady) with experience in Ethical work among the Medical and Dental Professions; must be conscientious, reliable, and have been successful. Write, with full particulars of past record and salary required, to 152/375, Office of this Paper.

REQUIRED, capable Medical Propaganda Representative in London area for Organotherapeutic Preparations, commencing September; connection amongst Gynaecologists desirable. Write, stating age, particulars of experience, salary required, etc., in strict confidence, to P.C.B. 43/20, Office of this Paper.

THE BRITISH DRUG HOUSES, LIMITED, are adding to the number of their Medical Representatives in various parts of the world. Applicants should write to the Company direct, giving full particulars of previous experience, age, and salary required.

UNQUALIFIED Assistant wanted for Manchester Warehouse of London House; one with both Retail and Wholesale experience preferred. Give full particulars, age, wages required, etc., 22/13, Office of this Paper.

WANTED, immediately, Representative-Salesman with good connection amongst Doctors, Hospitals, Nursing Homes, etc., for sale of Surgical Instruments, etc. 152/381, Office of this Paper.

(COLONIAL, INDIAN AND FOREIGN.)

BRITISH COLONY.—A firm of European Chemists in a British Colony have a vacancy for an Assistant with the qualification of the Pharmaceutical Society of Great Britain; salary £350 per annum; duty allowance; 18 months' engagement; free quarters and first class passages out and home; generous leave on full pay on re-engagement. Apply 152/382, Office of this Paper.

CALCUTTA.—Unmarried qualified Assistant required by first-class English firm; passages paid on usual agreement terms; director, now in England, will interview likely candidates. Apply "E. H.," 152/374, Office of this Paper.

SOUTH AFRICA, CAPE PROVINCE.—Qualified Assistant wanted; 3 years' engagement; must be competent and reliable; abstainer preferred. Send testimonials, stating age, experience, qualifications, and full particulars to Harley, Rodine Works, Perth.

SITUATIONS WANTED.

RETAIL [HOME].

A LOCUM; disengaged evening July 5 until August 2 inclusive; excellent references and experience; moderate terms. "Reliable," 129 Praed Street, London, W.

A QUALIFIED Chemist, 24, as Manager; experienced in all branches; sound references; please state salary. 20/39, Office of this Paper.

A QUALIFIED, 30, married, varied experience, seeks permanency Manager or Senior; Yorkshire or Midlands preferred. 21/35, Office of this Paper.

A QUALIFIED Chemist, 27, as Manager; experienced in all branches; North-West London preferred; please state salary. 21/37, Office of this Paper.

A VERY capable Assistant, unqualified, 27, Dispensing, Counter, Window, requires temporary post, London, for next two or three weeks. Harris, 39 Denning Road, Hampstead.

AS Locum or permanency; 31; qualified; good experience as assistant and manager; disengaged July 15. "Chemist," 19 New Steine, Brighton.

AS General Assistant, senior or locum; 30 years' experience; Stores, Hospitals or Insurance Dispensing. "G.," 130 Scott-Ellis Gardens, N.W.8.

ASSISTANT; unqualified; experienced, Dispensing, Photographics, Counter; manage Drug Stores; Locum or part-time; London, Metropolis, only. Write P.C.B. 41/33, Office of this Paper.

ASSISTANT, unqualified, 24, desires permanent situation; Counter, Dispensing; West-End experience; country town preferred, but not essential. 14/25, Office of this Paper.

ASSISTANT, 26, unqualified, requires permanent or temporary engagement; Dispensing, Counter, Photographic; good references. 14/33, Office of this Paper.

ASSISTANT, unqualified, 7 years' experience in all branches, desires permanency or Locum in London. "X.," 15 Clitheroe Road, S.W.9.

ASSISTANT, unqualified, 28, desires permanency or locum; good general experience; first-class references. J. M. Eversley, 148 Foleshill Road, Coventry.

ASSISTANT; Part I next week; 10 years' experience first-class Dispensing, Counter and Window-dressing; full knowledge all branches Photography; position for season or short-period locum; used to taking sole charge. Holden, 132 Old Bedford Road, Luton.

ASSISTANT; unqualified; 37; first-class training; managing, senior, or position of trust; good Salesman, Window-dresser; used to brisk high-class business; Photography, Prescriber, Sight-testing; well recommended; nominal salary. "Permanency," 21/16, Office of this Paper.

ASSISTANT, 21, Part I, free till October 1, seeks situation; five years' experience, Dispensing, Counter, Window-dressing; excellent references; 5 ft. 11½ in. 22/7, Office of this Paper.

BRIXTON DISTRICT.—Unqualified Assistant; now at liberty; 24; good experience all branches. Stocks, 109 Loughborough Park, S.W.9.

CAPABLE Manager requires similar post in or near Liverpool; 26; qualified; tall; excellent experience and references. 22/10, Office of this Paper.

CHEMIST, 50, married, desires position, Dispenser or Manager; all-round experience; good Prescriber. C. E. Young, 4 Regent Place, Leamington Spa.

DISENGAGED July 10; experienced, qualified Locum; elderly; active; good Dispenser; Institution preferred. "M.P.S.," 156 Lower Clapton Road, E.5.

DISENGAGED; 37; qualified; capable, with all-round experience; manager some years; good references; married; Locum or permanent. H. R. Halkes, 39 Monks Road, Lincoln.

DISENGAGED: Locum; active, middle-aged; unqualified; excellent references. W. P. Riley, 15 Wolsey Street, Heywood, Lancs.

DISPENSER (Honours) requires re-engagement; abstainer; Doctor or Chemist; Locum or permanent. 97 Haunch Lane, Kings Heath, Birmingham.

ELDERLY, qualified Chemist wants position of trust; Locum or permanency; excellent references; disengaged now. "Chemist," Appleton Villa, Widnes, Lancs.

ELDERLY qualified desires employment with short hours or part time; outdoors; country town preferred. Baker, 81 Elgar Road, Reading.

EXPERIENCED, unqualified Assistant wants permanency; married; 38; Dispensing, Counter, Window-dressing, Store; suburban, country experience; good references; good appearance and trustworthy. F. Field, 23 Sydenham Road, Sydenham, S.E.26.

EXPERIENCED Assistant wants position of trust; 6 years last berth; 40; married; good appearance. Westrip, 33 St. Stephen's Road, W.2.

EVENING or week-end post required by experienced Assistant; 24. "S.," 77 Sutherland Avenue, Maida Vale, W.9.

GIRL, 18, School Certificate Examination, desires Apprenticeship, Hospital or Retail Chemist, North London. Monson, Bank House, Lodge Drive, Palmers Green, N.13.

INTERVIEW now, free September.—Young qualified, married, all-round West-End and provincial experience, desires change to more progressive post; South-West England preferred. 19/7, Office of this Paper.

JUNIOR; age 21; Counter, Window-dressing, Photographic, Dispensing; best references. D. McCarthy, 31 Woodfield Road, Paddington, W.9.

LADY Dispenser, qualified, experienced, requires holiday work, August 19 to August 31; small salary for comfortable post. 279/10, Office of this Paper.

LADY, 25, 4 years' West-End, desires post with Chemist; Toilet, Fancy Department; good appearance and address; active, healthy, reliable; indoors not objected to; country town or seaside preferred; would consider London. Apply "F. K.," 46 Stevenage Road, S.W.6.

LADY Pharmaceutical Chemist; Hospital, Locum; disengaged July 29. Locum Dispenser, Western Hospital, Fulham.

LADY Dispenser (Hall) wants to obtain experience; in or near London; part-time preferred; no salary required. 13/39, Office of this Paper.

LADY Dispenser-Book-keeper, etc. (Hall), requires post with Doctor; experienced 11 years; 6 years present post; excellent references. Apply "E. E.," 36 Fladgate Road, Leytonstone, E.11.

LOCUM, 38, married, reliable, all-round man, Dispensing, Prescribing, Photo, etc., and a worker, requires holiday work; August any two weeks, town, seaside or country; unqualified. 14/2, Office of this Paper.

LOCUM; reliable; reasonable; City, West-End, Store and Hospital experience; best references; disengaged. "Lichen," 404 Essex Road, Islington, N.

LOCUM; unqualified; disengaged July 8; engaged August 12 to 17; can manage. "Radix," 72 Tremadoc Road, Clapham, S.W.4.

LOCUM; qualified; disengaged July 6; excellent references; suitable terms. "I. E. I.," 8 Victoria Road, Marlow-on-Thames.

LOCUM; qualified; disengaged July 28 to August 10, August 25 to September 7, and after October 6. "Pharmist," 57 Brown Road, Walthamstow, Essex.

LOCUM; experienced; qualified; open dates August 6 to 17, September 16 onwards. Wood, 33 Union Road, West Croydon, Surrey.

LOCUM; qualified; reliable; vacant dates, July 15 to August 4. "Pharmacist," 43 Cheddon Road, Taunton.

LOCUM or permanent; best experience; country town or London; unqualified. "Chemical," 7 Regent Place, London, S.W.1.

LOCUM; now disengaged; filling up for season; good experience and business ability; qualified; £5 per week. "H.," 20/31, Office of this Paper.

LOCUM; qualified; highest references; thoroughly experienced; disengaged July 20 till August 16. "Locum," 84a Green Street, Eastbourne.

LOCUM; August 26 to September 9 inclusive only vacant dates; town or country. "Chemicus," 56 Rudloe Road, Balham, S.W.12.

LOCUM, concluding at Birmingham August 3, free for engagement after that date in Midlands or elsewhere; highest references; unqualified. "E. F.," 69 Cross Street, Islington, London, N.1.

LOCUM; 33; qualified; varied experience, manager and own business; 4 weeks from July 29; London or near preferred; good references. Mason, 19 Newton Road, Bayswater, W.2. Phone: Park 4103.

LOCUM or permanency (referred Pharmacy); disengaged July 9; good reference; Dispensing, Counter, Windows. Temperton, 101 St. Mark's Road, Enfield.

LOCUM or permanency; qualified; experienced; disengaged August 4 onwards. "Pharmacist," 67 Western Road, Ealing, W.

LOCUM; disengaged till August 9; age 48; well recommended; moderate salary. "M.P.S.," "Wyncliffe," Kingsgate, Broadstairs.

LOCUM, unqualified, from July 22-August 4; London or suburbs; 12 years' experience, West End (last three years). 22/19, Office of this Paper.

LONDON.—Junior Assistant; unqualified; 5 years' experience, in or about London; ready at once. "C. R.," 4 Alberta Road, Bush Hill Park, Enfield.

MANAGER, qualified, desires change; London and provincial all-round experience; married; undeniable references; free at a month. 19/36, Office of this Paper.

MANAGER, qualified, 37, good Prescriber and Dispenser, used to quick work, able to make and keep customers, desires permanency, London area; house essential; free one month after engagement; wages and commission. 22/29, Office of this Paper.

MANAGER; experienced; energetic; reliable; middle-age; good Salesman; increase Branch or Drug Store; London; entertain succession; unregistered. Write "Energy," 22/18, Office of this Paper.

M.P.S., 35 years, desires post as Locum, Manager or Assistant; recently disposed of own business; at liberty after July 15. 14/29, Office of this Paper.

PART-TIME Locum or permanent; lady Dispenser-Book-keeper (Hall), 5 years' experience, desires post. Day, "Brimley," Richmond Road, Wolverhampton.

PART-TIME berth required; London or suburbs; qualified; all-round experience. "Radix," 5 Jeffreys Place, Swansea.

PHARMACIST, 33, experienced Retail, etc., has one or two evenings free (easy distance Westminster). "Chemist," 31 Effra Road, Brixton, S.W.

POSITION desired by qualified Chemist; extensive experience in Retail and Wholesale; sales promotion, salesmanship and window display is his forte; particularly interested in sales organisation of firms with many branches. Write 16/350, Office of this Paper.

QUALIFIED, 22, requires position with firm of Chemists; disengaged end of July; excellent references. 14/20, Office of this Paper.

QUALIFIED man, 25, now managing small suburban shop, desires change with more scope; energetic; quick and accurate Dispenser; Counter and Window-dressing; excellent references; City, West-End or Kent preferred; Hospital or Retail; free August 7. Randell, 13 Atkins Road, Clapham Park, S.W.12.

QUALIFIED; 46; single; all-round experience; references good; permanency preferred; disengaged July 15. "S.," 34 Cambridge Gardens, Hastings.

QUALIFIED; 34; Scot; experienced; reliable; energetic; trustworthy; 8 years manager previous position; disengaged August 1; London preferred. 20/27, Office of this Paper.

QUALIFIED Locum; part or whole time; elderly; active; West or East preferred; good reference; disengaged. Warrington, 665 Commercial Road, Stepney, E.

QUALIFIED; 24; Dispensing, Counter, Photography, Window-dressing; London or Suburbs preferred; hard work no objection; free July 15. "Chemist," 26 Malvern Terrace, Brynmill, Swansea

QUALIFIED, 35, married, desires change; Assistant or Manager; reliable; Liverpool or Wirral. "Pharmacist," 109 Amptbill Road, Aigburth, Liverpool.

QUALIFIED (23) desires change; good experience and references; Locum or permanency. "Chemist," 210 Reede Road, Dagenham, Essex.

QUALIFIED, married, 39, seeks progressive permanency as Manager, Senior Assistant or Representative; high-class Retail and Hospital experience; state offers. 22/15, Office of this Paper.

SCOTSMAN, abstainer, 20, desires situation till end of September; good Counter experience. Scott, 53 Galapark Road, Galashiels, Scotland.

SITUATION required as Junior; 20; tall; fluent French; London district preferred. Attenborough, Jersey.

TEMPORARY situation, July 15-mid-September; Improver; had high-class Dispensing experience. Simpson, Littleton, Winchester.

THOROUGHLY experienced, energetic man, 36, seeks engagement; unqualified; well up in Dispensing, Photographic and Counter; first-class references; disengaged. "Atropia," 113 Commercial Road, Macclesfield.

UNQUALIFIED desires post; Counter, Dispensing, Photographic, and D. & P.; single; abstainer; good references; season or permanent. 14/10, Office of this Paper.

UNQUALIFIED; Dispensing, Counter and Photographic; good references; free one week's notice. "Locum," 60 Manchura Road. West Side, Clapham Common, S.W.

WANTED, post as Junior Assistant for period July-September; Dispensing and high-class Counter; passed Part I. Blackwell, 37 Cynthia Road, Bath.

WHOLESALE.

A.A.—QUALIFIED Chemist wishes to represent reputable House in West of England; own car; good personality. Apply 21/15, Office of this Paper.

AN energetic, experienced Representative, sound connection London, South and South-Eastern Counties, Retail trained, successful propagandist, desires position leading house; salary and expenses. 14/19, Office of this Paper.

GENTLEMANLY, experienced Pharmacist (38), representing small firm Manufacturing Chemists, desires similar position first-class house; South preferred. "Cyrex," 18/7, Office of this Paper.

EXPERIENCED Traveller, with long experience in India and the East, is prepared to represent one or two additional firms. C. Y. Lyon, 66 Bridge Lane, N.W.11.

EXPERIENCED Traveller, sound London connection, representing established London House, is open to take up additional line. P.C.B. 43/34, Office of this Paper.

EXPERIENCED Representative seeks appointment with good House; travelled England and Wales; Drugs, Surgicals. Specialities, Medical Propaganda; up-to-date knowledge of Therapeutics; well recommended. P.C.B. 43/31, Office of this Paper.

M.P.S. requires part-time employment; wide British and Continental Wholesale and Retail experience and connections; Agencies, Buying, Propaganda, Technical Correspondence; London and Watford district. 20/34, Office of this Paper.

PHARMACIST, qualified, age 34, desires position where he can use his inventive brain; hundreds of his suggestions adopted; packings, novelties, show stands, window display, new goods, cost reducers, systems, difficulties of all kinds solved; take charge of staff, interview buyers and sellers; 10 years in Wholesale. 19/9, Office of this Paper.

REPRESENTATIVE (shortly disengaged), valuable 3,000 Chemists' and Doctors' connection in South-Eastern and Western Counties, to good house; permanent engagement desired; Proprietary lines preferred; salesmanship and propaganda on neglected ground a speciality; good appearance and address; own car; salary and expenses basis; locate anywhere. S. W. Hoseason, 4 Ashbourne Grove, Hale Lane, Mill Hill, N.W.7.

REPRESENTATIVE, experienced, working Chemists West Riding, Yorkshire, East Lancashire, requires good commissions. "W.," 20 Ethel Street, Keighley.

REPRESENTATIVE, London, 5 years premier Perfumers, desires change; sound connection; energetic worker. P.C.B. 41/32, Office of this Paper.

SALES Organisation and Management.—Pharmacist, at present employed with one of the foremost firms of Manufacturing Chemists in this country, desires change; up-to-date methods of salesmanship and marketing; payment by results preferred. Write 16/35, Office of this Paper.

UNQUALIFIED, 24, with 6 years' Retail experience, desires progressive post, any capacity, in Wholesale House; free end of July. "R. J. P.," 33 Kilmorie Road, Forest Hill, S.E.23.

UNQUALIFIED (young), with exceptional sound experience with several first-class firms; accustomed to responsibility; has personally prepared in large quantities B.P., B.P.C., Toilets and Proprietaries; specialises in Compressed Tablets (plain and coated), also Pills and Capsules; excellent references. Write "Queux," 20/33, Office of this Paper.

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